Vol. 1020 NUMBER 1

# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

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# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

**May 3, 1983** **Volume 1030** **Number 1**


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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

| | |
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| Transmittal fee | $ 125.00 |
| Search fee | |
| U.S. Patent and Trademark Office as Searching Authority | |
| · No corresponding prior U.S. national application filed | 500.00 |
| · Corresponding prior U.S. national application filed | 250.00 |
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| · All cases | 670.00 |
| International Fees | |
| Basic Fees (first 30 pages) | 265.00 |
| Basic Supplemental Fee (for each page over 30) | 5.00 |
| Designation fee (for each national or regional office) | 65.00 |

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

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### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,539,794,** Re. S.N. 464,826, Filed Feb. 8, 1983, Cl. 362/34, SELF-CONTAINED CHEMILUMINESCENT LIGHTING DEVICE, Michael McKay, et al., Owner of Record: *American Cyanamid Co., Stamford, Conn.,* Attorney or Agent: Gordon L. Hart, Ex. Gp.: 223

**4,207,942,** Re. S.N. 464,036, Filed Feb. 4, 1983, Cl. 165/1, PLATE HEAT EXCHANGERS, Collin Thomas Cowan, Owner of Record: *The A.P.V. Co. Ltd., Crawley, Sussex, England,* Attorney or Agent: Edwin T. Bean, et al., Ex. Gp.: 346

**4,246,137,** Re. S.N. 458,520, Filed Jan. 17, 1983, Cl. 252/436, METHOD OF PREPARING ZIRCONIA-SILICA XEROGELS, THE XEROGELS, AND XEROGEL CATALYSTS, Robert A. Dombro, et al., Owner of Record: *Chemplex Co., Rolling Meadows, Ill.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 116

**4,306,122,** Re. S.N. 463,751, Filed Feb. 4, 1983, Cl. 179/170NC, TELEPHONE LINE CIRCUIT, Aloysius J. Nijman, et al., Owner of Record: *U.S. Philips Corp., Tarrytown, N.Y.,* Attorney or Agent: Thomas A. Briody, Ex. Gp.: 214

**4,311,000,** Re. S.N. 464,045, Filed Feb. 4, 1983, Cl. 57/6, NOVELTY YARN PRODUCTION, Joe F. London, Jr., et al., Owner of Record: *Burlington Industries, Inc., Greensboro, N.C.,* Attorney or Agent: John W. Mall, Ex. Gp.: 245

**4,332,557,** Re. S.N. 465,433, Filed Feb. 7, 1983, Cl. 433/77, DENTAL OPERATORY SYSTEM, Tony Watanabe, Owner of Record: *Takara Co., Somerset, N.J.,* Attorney or Agent: Stephen E. Feldman, et al., Ex. Gp.: 333

**4,341,575,** Re. S.N. 462,800, Filed Feb. 1, 1983, Cl. 156/66, MEANS FOR JOINING FLEXIBLE FASTENER STRIPS TO FILM, AND PRODUCT, Andre M. Herz, Owner of Record: *Miningrip, Inc., Orangeburg, N.Y.,* Attorney or Agent: James van Santen, Ex. Gp.: 161

**4,343,050,** Re. S.N. 463,845, Filed Feb. 4, 1983, Cl. 3/13, INTRAOCULAR LENSES, Charles D. Kelman, Owner of Record: *Inventor,* Attorney or Agent: Henry Sternberg, Ex. Gp.: 336

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### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**3,999,538,** Reexam. No. 90/000,349, Requested: Mar. 30, 1983, Cl. 128/2G, METHOD OF BLOOD VISCOSITY DETERMINATION, Van B. Philpot, Jr., Owner of Record: *Van B. Philpot, Jr., Houston, Miss.,* Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 330, Requester: Owner

**4,016,750,** Reexam. No. 90/000,351, Requested: Mar. 24, 1983, Cl. 73/629, ULTRASONIC IMAGING METHOD AND APPARATUS, Phillip S. Green, Owner of Record: *Stanford Research Institute, Menlo Park, Calif.,* Attorney or Agent: Victor R. Beckman, Ex. Gp.: 240, Requester: Owner

**4,021,910,** Reexam. No. 90/000,353, Requested: Apr. 5, 1982, Cl. 29/526.2, METHOD FOR TREATING SUPERALLOY CASTINGS, William R. Freeman, et al., Owner of Record: *Homet Turbine Components Corp., Muskegon, Mich.,* Attorney or Agent: Dugald S. McDougall, Ex. Gp.: 320, Requester: William E. Meyer, Stoneham, Mass.

**4,072,309,** Reexam. No. 90/000,357, Requested: Mar. 28, 1983, Cl. 272/136, MULTI-PURPOSE EXERCISE DEVICE, Jerry Lee Wilson, Owner of Record: *Inventor,* Attorney or Agent: Edward J. Quirk, Ex. Gp.: 330, Requester: Contractor Equipment Mfg., Inc., Ashland, Ohio

**4,104,822,** Reexam. No. 90/000,352, Requested: Mar. 31, 1983, Cl. 46/74D, ROTATING CIRCULAR AIRFOIL, Henry Wendell Rodgers, Owner of Record: *Inventor,* Attorney or Agent: Ronald F. Weiszmann, Ex. Gp.: 333, Requester: Alan J. Adler, Palo Alto, Calif.

**4,266,731,** Reexam. No. 90/000,356, Requested: Mar. 28, 1983, Cl. 239/676, DUMP SPREADER, Charles S. Musso, Jr., Owner of Record: *Air-Flo Manufacturing Co., Inc., Prattsburg, N.Y.,* Attorney or Agent: Eugene S. Stephens, Ex. Gp.: 313, Requester: Tarrant Manufacturing Co., Saratoga Springs, N.Y.

**4,338,654,** Reexam. No. 90/000,355, Requested: Apr. 4, 1983, Cl. 362/268, VARIABLE SPOT STAGE LIGHT, Richard Logothetis, Owner of Record: *Inventor,* Attorney or Agent: Kevin P. Redmond, Ex. Gp.: 220, Requester: Richard Logothetis, Sugar Loaf, N.Y.

**4,366,571,** Reexam. No. 90/000,354, Requested: Mar. 28, 1983, Cl. 337/30, ELECTRIC FURNACE CONSTRUCTION, Ronald W. Palmquist, Owner of Record: *Requester,* Attorney or Agent: John P. De Luca, Ex. Gp.: 212, Requester: Corning Glass Works, Corning, N.Y.

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**Patent Data Exchange**

Under the provisions of Section 6(a), of Title 35, United States Code, the Commissioner of Patents and Trademarks has entered into an agreement with Mead Data Central, a division of the Mead Corp., for use of the LEXIS, LEXPAT and NEXIS search systems and data bases. Mead Data Central will provide the PTO with the equivalent of $77,000 worth of access each year for the next five years. In exchange, the PTO will provide Mead Data Central with copies of selected office records and computer tape updates of patent text, patent assignment and patent classification information.

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Apr. 5, 1983.

GERALD J. MOSSINGHOFF,
*Commissioner of Patents and Trademarks.*

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The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

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National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-441,198. CARRIAGE FOR CABLE LOGGING SYSTEM.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-427,857. DIMERIC ENKEPHALINS.

SN 6-468,590. REPAIR OF TISSUE IN ANIMALS.

SN 6-470,920. FIBER OPTIC $CO_2$ PARTIAL PRESSURE SENSOR.

SN 6-475,352. PLASMID CLONING VECTOR pAS1.

DEPARTMENT OF THE INTERIOR

SN 6-258,075 (4,362,557). PURIFYING TITANIUM-BEARING SLAG BY PROMOTED SULFATION.

SN 6-435,534. SELECTIVE RECOVERY OF BASE METALS AND PRECIOUS METALS FROM ORES.

SN 6-435,535. SELECTIVE RECOVERY OF BASE METALS AND PRECIOUS METALS FROM ORES.

SN 6-440,487. REMOVAL OF INSULATION FROM ELECTRONIC SCRAP.

SN 6-440,893. HYDROMETALLURGICAL RECOVERY OF ARSENIC FROM ORES AND CONCENTRATES.

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**Patent Suits**

Notices under 35 U.S.C. 290; Patent Act of 1952

**3,173,583,** Eugene A. Wahl, BIN ACTIVATOR; **3,261,508, same,** VIBRATORY BIN ACTIVATOR, **filed** Apr. 30, 1976, D.C.N.J. (Newark), Doc. 76-791, *Eugene A. Wahl, et al.* v. *Rexnord, Inc.* Stipulation and Order of Dismissal of action filed Jan. 6, 1981. **Same, filed** Feb. 10, 1981, D.C.N.J. (Newark), Doc. 81-329, *Carman Industries, Inc., et al.* v. *Eugene A. Wahl, et al.* Order for permanent injunction, in favor of Carman Industries, Inc., filed Dec. 23, 1982.

**3,220,481,** Baker Oil Tools, Inc., APPARATUS FOR AUTOMATICALLY FILLING CONDUIT STRINGS, **filed** Mar. 2, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-1635, *Baker Oil Tools, Inc.* v. *Davis-Lynch, Inc.*

**3,261,508. (See 3,173,583.)**

**3,286,858,** Leonard Julien, CANE PLANTER, **filed** Feb. 24, 1982, D.C., W.D. La. (Shreveport), Doc. 82-673, *Leonard Julien* v. *Zeringue Co., et al.*

**3,345,458,** RCA Corp., DIGITAL STORAGE AND GENERATION OF VIDEO SIGNALS, **filed** May 23, 1978, D.C. Del. (Wilmington), Doc. 78-198, *RCA Corp.* v. *Applied Digital Data Systems, Inc.* Order and Final Judgment filed Feb. 8, 1983. **Same, filed** May 17, 1979, D.C. Del. (Wilmington), Doc. 79-243, *RCA Corp.* v. *Hazeltine Corp.* Order and Final Judgment filed Feb. 8, 1983. **Same, filed** May 25, 1979, D.C. Del. (Wilmington), Doc. 79-491, *Lear Siegler, Inc.* v. *RCA Corp.* Order and Final Judgment filed Feb. 8, 1983.

**3,375,549,** Uniroyal, Inc., METHOD AND APPARATUS FOR REFINING AND SEPARATING PLASTIC MATERIALS, **filed** Mar. 5, 1982, D.C., E.D. Va. (Norfolk), Doc. 82-194-N, *Uniroyal, Inc.* v. *Robert Barr, Inc.* Final Judgment filed Feb. 1, 1983.

**3,393,824,** Arthur I. Appleton, NONJAMMING HOUSING AND COVER ASSEMBLY, **filed** Dec. 21, 1976, D.C., N.D. Ill. (Chicago), Doc. 76 C 4627, *Arthur I. Appleton, et al.* v. *Crouse-Hinds Co.* Findings of fact and conclusions of law, memorandum and order, and

judgment order dismissing plaintiff's complaint entered, per order dated Dec. 28, 1981.

**3,398,689,** Instrumentation Specialties Co., APPARATUS PROVIDING A CONSTANT-RATE TWO-COMPONENT FLOW STREAM, **filed** Nov. 23, 1976, D.C., N.D. Ill. (Chicago), Doc. 76 C 4340, *Instrumentation Specialties Co.* v. *Waters Associates, Inc., et al.* Convenant and Stipulated Order of Dismissal, with prejudice, against defendants Wayne E. Shumaker and George Neale, and without prejudice, against defendant Waters Associates entered, per order dated Sept. 22, 1978.

**3,427,282,** Uniroyal, Inc., USE OF SELECTED 4, 4'-METHYLENE-BIS(2-ALKYLANILINES) AS CURING AGENT FOR EPOXY RESINS, **filed** Feb. 8, 1983, D.C., S.D.N.Y., Doc. 83-CIV-1004, *Uniroyal, Inc.* v. *Ciba-Geigy Corp.*

**3,429,211,** Solvay & Cie, Societe Anonyme, APPARATUS FOR TRIMMING THE NECK OF HOLLOW PLASTIC ARTICLES, **filed** Jan. 20, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 0369, *Solvay & Cie, Societe Anonyme, et al.* v. *Alan J. Thatcher, doing business as Machine Tool and Mold Co.*

**3,439,795,** Ashworth Bros., Inc., FLAT WIRE CONVEYOR BELT HAVING SLOTTED BAR LINKS; **Re. 27,690, same, filed** Jan. 17, 1983, D.C. Md. (Baltimore), Doc. K–83–144, *Ashworth Bros., Inc.* v. *The Cambridge Wire Cloth Co.*

**3,466,912,** Rotary Profile Anstalt, MANUFACTURE OF ANNULAR ARTICLES, **filed** Dec. 23, 1983, D.C. Dist. of Columbia (Wash. D.C.), Doc. 82–3648, *Formflo Ltd.* v. *Rotary Profile Anstalt, et al.*

**3,480,504,** Good and Morgan, AUTOMATIC APPARATUS FOR APPLYING COVERS TO BIOLOGICAL SLIDES, **filed** Jan. 10, 1983, D.C. Minn. (Minneapolis), Doc. 4–83 Civil 35, *Rose M. Morgan and Dorothy I. Good* v. *Gibbco Scientific, Inc., et al.* **Same, filed** Mar. 3, 1983, D.C., W.D. Pa. (Pittsburgh), Doc. 83–518, *Shandon Southern Instruments, Inc.* v. *Rose M. Morgan and Dorothy I. Good.*

**3,491,590,** Billy K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS; **3,633,413,** National Tractor Pullers Association, Inc., DEVICE FOR MEASURING PULLING POWER, **filed** Dec. 30, 1976, D.C., N.D. Ill. (Chicago), Doc. 76 C 4810, *National Tractor Pullers Association, Inc.* v. *Billy K. Watkins.* Judgment is entered in favor of defendant, per order dated Mar. 10, 1980.

**3,493,496,** Desalination Systems, Inc., PURIFIED WATER SUPPLY APPARATUS AND METHOD, **filed** Oct. 1, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 6060, *Desalination Systems, Inc.* v. *Rainsoft Water Conditioning Co.* Case dismissed on Feb. 16, 1983.

**3,507,861,** Eli Lilly and Co., Inc., CERTAIN 3-METHYL-CEPHALOSPORIN COMPOUNDS; **3,655,656, same,** CRYSTALLINE CEPHALEXIN MONOHYDRATE **filed** Nov. 20, 1978, D.C., D.C.N.J. (Newark), Doc. 78–2804, *Premo Pharmaceutical Labs., Inc.* v. *Eli Lilly and Co., Inc.* Stipulation and Order of Dismissal filed July 10, 1981.

**3,507,861,** Eli Lilly and Co., Inc., CERTAIN 3-METHYL-CEPHALOSPORIN COMPOUNDS, **filed** July 10, 1979, D.C. Del. (Wilmington), Doc. 79–331, *Eli Lilly and Co.* v. *Optel Corp.* Stipulation and Order dismissing action with prejudice filed Feb. 10, 1983.

**3,519,129,** Soren E. Peterson, CONVEYOR AND SORTING STRUCTURE IN AGRICULTURAL MACHINES, **filed** Feb. 10, 1983, D.C. Idaho (Boise), Doc. 83–4031, *Soren E. Peterson* v. *Spudnik Equipment Co.*

**3,538,657,** Lawrence Macrow, GAS-LIQUID CONTACT APPARATUS, **filed** Mar. 10, 1983, D.C., W.D.N.Y. (Buffalo), Doc. Civ-83-267C, *Lawrence Macrow* v. *Lake Erie Technology, Inc., et al.*

**3,563,399,** Charles C. Shivvers, METHOD FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN; **3,765,547, same,** APPARATUS FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN; **3,765,548, same,** SWEEP AUGER STRUCTURE, **filed** Mar. 4, 1983, D.C. Neb. (Omaha), Doc. CV83-0-158, *Charles C. Shivvers* v. *Nebraska Engineering Co.*

**3,571,545,** Controls Co. of America, TOGGLE SWITCH WITH PIVOTAL SHORTING BAR BRIDGING STATIONARY CONTACT PINS AND SLIDABLE CAM BLOCK DETENT MEANS, **filed** Dec. 11, 1981, D.C., M.D. Pa. (Scranton), Doc. 81-1412, *Edward H. Key* v. *Edward G. Haderer and Controls Co. of America.* Action dismissed, without costs, provided that jurisdiction is reserved to issue such further orders as may be advisable. Filed Feb. 15, 1983.

**3,615,087,** Inventec International, Ltd., WORK-BENCHES; **4,076,229, same, filed** Jan. 14, 1980, D.C., W.D.N.C. (Asheville), Doc. B-C-80-7, *The Black & Decker Mfg. Co. and Inventec International, Ltd.* v. *Emerson Electric Co.*

**3,633,413. (See 3,491,590.)**

**3,643,085,** Jacqualine Durand, PHOTOGRAPHIC LIGHT BOX, **filed** Nov. 26, 1980, D.C., N.D. Ill. (Chicago), Doc. 80C6360, *Jacqualine Durand* v. *Bogen Photo Corp., et al.* Cause dismissed with prejudice pursuant to Rule 41(a)(1) of F.R.Civ.P., per order dated Dec. 20, 1982.

**3,655,656. (See 3,507,861.)**

**3,659,284,** Sanders Associates, Inc., TELEVISION GAMING APPARATUS; **Re. 28,507, same, filed** Dec. 13, 1978, D.C., N.D. Ill. (Chicago), Doc. 78 C 4951, *The Magnavox Co. and Sanders Associates, Inc.* v. *Bally Mfg. Corp., et al.* Final Judgment on Consent entered June 24, 1982.

**3,697,675,** Beard and Garen, STEREOSCOPIC TELEVISION SYSTEM, **filed** Dec. 10, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6444, *Terry D. Beard and Eric R. Garen* v. *3D Video Corp., et al.*

**3,765,547. (See 3,563,399.)**

**3,765,548. (See 3,563,399.)**

**3,782,708,** Kuhlman Corp., SPRING ASSEMBLY AND METHODS AND MACHINES FOR THE MANUFACTURE THEREOF, **filed** Sept. 16, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-73476, *Kuhlman Corp.* v. *P. J. Wallbank Springs, Inc.* Action dismissed without prejudice and without costs, per Order of Dismissal filed Jan. 31, 1983.

**3,803,660,** Randomex, Inc., APPARATUS FOR CLEANING DISCS, **filed** Feb. 22, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 1058, *Randomex, Inc.* v. *Scopus Corp.* Defendant's motion for change of venue is granted. Accordingly, action transferred in its entirety to the District Court for the District of Massachusetts. Docketed Sept. 23, 1982.

**3,805,759,** Brunswick Corp., IGNITION SYSTEM WITH ADVANCE STABILIZING MEANS; **3,967,446, same,** EXHAUST RELIEF SILENCING APPARATUS FOR MARINE PROPULSION SYSTEMS; **4,088,108, same,** MULTIPLE CAPACITOR MEANS IGNITION SYSTEM, **filed** Aug. 27, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-4414MML (Kx), *Suzuki Motor Co., Ltd., et al.* v. *Brunswick Corp.*

**3,805,759,** Brunswick Corp., IGNITION SYSTEM WITH ADVANCE STABILIZING MEANS; **4,088,108, same,** MULTIPLE CAPACITOR MEANS IGNITION SYSTEM, **filed** Sept. 15, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 4810, *Hitachi Ltd.* v. *Brunswick Corp.*

**3,841,718,** Caterpillar Tractor Co., AUGMENTED CRESCENT SEAL WITH COMPENSATING LOAD RING, **filed** Dec. 30, 1980, D.C. Wyoming (Cheyenne),

Doc. C80-0384-B, *Caterpillar Tractor Co.* v. *Berco, S.p.A., et al.* Defendant, Berco, S.p.A. is permanently enjoined and restrained from further infringing plaintiff's patent. Filed Oct. 1, 1982. Order vacating judgment filed Oct. 8, 1982. Order reinstating Final Judgment filed Oct. 15, 1982.

**3,864,280,** Chevron Research Co., CATALYST FOR A N-BUTANE OXIDATION TO MALEIC ANHYDRIDE; **4,017,521, same,** PROCESS FOR THE MANUFACTURE OF MALEIC ANHYDRIDE USING HIGH SURFACE AREA CATALYST, **filed** Dec. 30, 1982, D.C., S.D. Tex. (Houston), Doc. H-82-3951, *Chevron Research Co.* v. *Denka Chemical Corp.*

**3,870,457,** Tappan Co., BLUE FLAME GAS SMOOTH TOP RANGE; **3,968,785, same, filed** Apr. 14, 1977, D.C., N.D. Ill. (Chicago), Doc. 77C1257, *Tappan Co.* v. *Raytheon Co., et al.* Stipulation and Order of Dismissal entered Oct. 17, 1980.

**3,874,540,** Walter E. Hidding, TAMPERPROOF CAP, **filed** Dec. 27, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 7877, *Walter E. Hidding, et al.* v. *Eagle Stores, Inc.*

**3,935,074,** Syva Co., ANTIBODY STERIC HINDRANCE IMMUNOASSAY WITH TWO ANTIBODIES, **filed** Feb. 5, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 0592, *Syva Co.* v. *Miles Laboratories, Inc.* **Same, filed** Aug. 4, 1981, D.C., N.D. Ohio (Toledo), Doc. C81-513, *Syva Co.* v. *Westgate Laboratory of Pathology, Inc.*

**3,939,954,** Qonaar Corp., CHECK RECEIVING AND TESTING APPARATUS, **filed** Jan. 28, 1983, D.C., N.D. Ill. (Chicago), Doc. 83C0574, *Qonaar Corp.* v. *General Signal Corp., et al.*

**3,941,051,** Printronix, Inc., PRINTER SYSTEM, **filed** Nov. 29, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6164, *Citizen Watch Co., Ltd.* v. *Printronix, Inc.*

**3,964,479,** Cobe Laboratories, Inc., EXTRACORPOREAL BLOOD CIRCULATION SYSTEM AND DRIP CHAMBER WITH ADJUSTABLE BLOOD LEVEL; **4,102,655, same,** BUBBLE TRAP, **filed** Jan. 28, 1983, D.C. Colo. (Denver), Doc. 83-Z-145, *Cobe Laboratories, Inc.* v. *Northern Colorado Kidney Center, et al.*

**3,967,446.** **(See 3,805,759.)**

**3,968,355,** Novo Products, Inc. AUTOMATIC NIGHT LIGHT STRUCTURE, **filed** Nov. 10, 1981, D.C., E.D. Mich. (Detroit), Doc. 81-74169, *Novo Products, Inc.* v. *Leviton Mfg. Co., Inc.* Case closed on Feb. 8, 1983.

**3,968,785.** **(See 3,870,457.)**

**4,004,768,** Nickson Industries, Inc., UNIVERSAL JOINT HANGER FOR TAILPIPES AND THE LIKE; **4,209,155, same,** HEAVY-DUTY BRACKET AND HANGER ASSEMBLY EMPLOYING SAME, **filed** Sept. 8, 1982, D.C., M.D. Fla. (Orlando), Doc. 82-458-ORL-CIV-K, *Nickson Industries, Inc.* v. *Rol America Mfg. Co. of America, Inc.*

**4,017,521.** **(See 3,864,280.)**

**4,033,136,** Robert C. Stewart, VAPOR ACTUATED POWER GENERATING DEVICE; **4,285,201, same,** VAPOR POWERED ENGINE ASSEMBLY, **filed** Mar. 9, 1983, D.C. Nev. (Las Vegas), Doc. CV-LV-83-166-HEC, *Quantum Energy, Inc.* v. *Robert C. Stewart, et al.*

**4,034,534,** Intalite International N.V., LOUVERED CEILING, **filed** Jan. 27, 1983, D.C., N.D. Ohio (Cleveland), Doc. C 83-400, *Intalite International N.V.* v. *American Luminous Ceilings, Inc.*

**4,060,730,** Elscint, Ltd., SCINTILLATION CAMERA FOR ESTABLISHING THE COORDINATES OF A RADIATION STIMULI PRODUCED BY A RADIATION FIELD, **filed** Jan. 10, 1983, D.C. District of Columbia (Wash. D.C.), Doc. 83-0042, *Elscint, Ltd.* v. *Technicare Corp.*

**4,076,229.** **(See 3,615,087.)**

**4,085,108.** **(See 3,805,759.)**

**4,102,655.** **(See 3,964,479.)**

**4,112,422,** Atari, Inc., METHOD AND APPARATUS FOR GENERATING MOVING OBJECTS ON A VIDEO DISPLAY SCREEN; **4,314,236, same,** APPARATUS FOR PRODUCING A PLURALITY OF AUDIO SOUND EFFECTS, **filed** Dec. 14, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 7485, *Atari, Inc.* v. *Coleco Industries, Inc.*

**4,126,087,** Willie J. McLamb, COOKER, **filed** Feb. 15, 1983, D.C., W.D.N.C. (Statesville), Doc. ST-C-83-27, *National Kook-Rite Kooker Corp., et al.* v. *McLamb Enterprises, Inc. and Willie J. McLamb.*

**4,134,237,** Pool Co., MODULAR SECTION MAST, **filed** Jan. 14, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-338, *Pool Co.* v. *Hercules Offshore Drilling Co., et al.*

**4,142,887,** Reactive Metals & Alloys Corp., STEEL LADLE DESULFURIZATION COMPOSITIONS AND METHODS OF STEEL DESULFURIZATION, **filed** Dec. 18, 1980, D.C., W.D. Pa. (Pittsburgh), Doc. 80-1812, *Reactive Metals & Alloys Corp.* v. *ESM, Inc.* The above action, including all claims and counterclaims, are hereby dismissed with prejudice. Claims 1 thru 8 of Pat. No. 4,142,887 are invalid under 35 U.S.C. §§102 and 103. Filed Dec. 20, 1982.

**4,143,740,** Floyd G. Matthews, MODULAR STAIRWAY SYSTEM FOR INSTALLATION ON STRUCTURES HAVING NON-LINEAR WALLS, **filed** Feb. 28, 1983, D.C., C.D. Ill. (Danville), Doc. 83-2044, *David A. Green and Paul S. Greene, et al.* v. *Wesley D. Matthews and Floyd G. Matthews, et al.*

**4,145,300,** Sublistatic Holding S.A., DEVELOPERS CONTAINING MAGNETIC PARTICLES AND A SUBLIMABLE DYESTUFF; **4,246,331, same,** ELECTROPHOTOGRAPHIC DEVELOPERS CONTAINING SUBLIMABLE DYES; **4,251,611, same,** PROCESS FOR FORMATION OF PERMANENT IMAGE, **filed** May 27, 1981, D.C., E.D. Va. (Norfolk), Doc. 81-470-N, *Spectra Corp. and Sublistatic Holding S.A.* v. *Edward W. O'Brien, doing business as Powerband Products of Va.* Defendant is enjoined from further infringing plaintiff's Patent No. 4,145,300. Plaintiff's claim of infringement of U.S. Patent Nos. 4,246,331 and 4,251,611 are dismissed. Filed Jan. 10, 1983.

**4,146,994,** Clarence Williams, DOOR HAVING IMPROVED CLOSING AND LATCHING SYSTEMS, **filed** Oct. 25, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 4468, *Clarence Williams* v. *Justrite Mfg. Co.* This case, including the counterclaim, is dismissed without prejudice. Filed Jan. 25, 1983.

**4,152,167,** Set Products, Inc., MATRIX FORMING COMPOSITION, **filed** Nov. 19, 1982, D.C. Md. (Baltimore), Doc. M82-3360, *Set Products, Inc.* v. *Fox Industries, Inc., et al.*

**4,179,081,** John C. Parry, APPARATUS FOR APPLICATION OF PLASTICS STRETCH FILMS; **4,248,392, same, filed** July 6, 1982, D.C.N.J. (Newark), Doc. 82-2176, *John C. Parry, doing business as J. C. Parry & Sons Co., Inc.* v. *Time SavRs Associates, et al.* Order dismissing action filed Jan. 13, 1983.

**4,195,732,** Great Northern Corp. and Presto Products, Inc., SUPPORTING AND SPACING MEMBER FOR WEB MATERIAL ROLLS; **Reg. No. 1,170,188** (ROLLGUARD), Great Northern Corp., **filed** Feb. 11, 1983, D.C., W.D. Mich. (Kalamazoo), Doc. K83-44CA4, *Acme Polymers, Inc., et al.* v. *Great Northern Corp. and Presto Products, Inc.*

**4,208,831,** Shelcore, Inc., DRIVING SIMULATOR TOY, **filed** Mar. 2, 1983, D.C., S.D.N.Y., Doc. 83-CIV-1618 KTD, *Shelcore, Inc.* v. *Artsana of America, Inc.*

**4,209,155. (See 4,004,768.)**

**4,209,875,** Black & Decker, Inc., CORDLESS VACUUM CLEANER BOWL AND FILTER SYSTEM, **filed** Dec. 23, 1981, D.C. Md. (Baltimore), Doc. HM-81-3299, *Black & Decker (U.S.), Inc. and Black & Decker, Inc.* v. *Hiraoka & Co. (H.K.) Ltd.* Plaintiffs are the owners of Pat. No. 4,209,875 which is valid and has been infringed. Defendant is permanently enjoined from further infringing Plaintiff's patent. Filed Apr. 27, 1982.

**4,217,473,** W. H. Brady Co., CONNECTING FLEXIBLE SWITCH; **4,218,600, same, filed** Jan. 3, 1983, D.C., N.D. Ill. (Chicago), Doc. 83C0020, *W. H. Brady Co.* v. *Carl Gorr Printing Co.*

**4,218,600. (See 4,217,473.)**

**4,228,399,** Harco Corp., OFFSHORE PIPELINE ELECTRICAL SURVEY METHOD AND APPARATUS; **4,322,805, same,** ELECTRICAL SURVEY METHOD AND APPARATUS, **filed** Feb. 1, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-820, *Fera Corp.* v. *Harco Corp.*

**4,232,477,** Shelcore, Inc., INFLATABLE HASSOCK-SHAPED TOY, **filed** Dec. 21, 1982, D.C.N.J. (Newark), Doc. 82-4309, *Shelcore, Inc.* v. *Glenco Infant Items, Inc.*

**4,245,505,** Turco Mfg. Co., INDICATOR OF AMOUNT OF LIQUEFIED GAS IN BOTTLE, **filed** Jan. 17, 1983, D.C., S.D. Ill. (Alton), Doc. 83-5013, *Sunbeam Leisure Products co.* v. *Turco Mfg. Co.*

**4,246,331. (See 4,145,300.)**

**4,248,392. (See 4,179,081.)**

**4,251,611. (See 4,145,300.)**

**4,264,892,** Lincoln M. Zonn, ALARM DEVICE, **filed** Dec. 15, 1982, D.C., N.D. Calif. (San Francisco), Doc. C82 6789 EFL, *Lincoln M. Zonn, et al.* v. *Tandy Corp., et al.*

**4,285,201. (See 4,033,136.)**

**4,313,112,** Daniel F. Foster, COMPUTER WORK STATION ASSEMBLY AND MOUNTING APPARATUS THEREFOR, **filed** Feb. 3, 1983, D.C., N.D. Ala. (Birmingham), Doc. CV83-G-0287-S, *Input-Ez Corp., Inc. and Daniel F. Foster* v. *Health Science Products, doing business as HSP Computer Furniture, et al.*

**4,313,861,** Union Carbide Corp., LATEX AUTODEPOSITION COATINGS, **filed** Feb. 2, 1983, D.C., S.D. W. Va. (Charleston), Doc. 83-2103, *Amchem Products, Inc.* v. *Union Carbide Corp., et al.*

**4,314,236. (See 4,112,422.)**

**4,320,892,** Howard Ray Longbrake, KNIFE SHARPENER, **filed** Jan. 3, 1983, D.C., W.D.N.Y. (Buffalo), Doc. 83-0009C, *Arthur Lansky Levine & Associates, Inc., doing business as Lansky Sharpeners* v. *Howard Ray Longbrake, doing business as Loray Sharpeners.*

**4,321,038,** Van R. Dental Products, Inc., BRAIDED GINGIVAL RETRACTION CORD, **filed** Dec. 20, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6662, *Van R Dental Products, Inc.* v. *Stitchcraft Thread Mills, Inc., et al.*

**4,321,716,** Fred J. Shrock, CONVERTIBLE SEATBED, **filed** Sept. 3, 1982, D.C., N.D. Ind. (South Bend), Doc. S82-0426, *Fred J. Shrock* v. *Better Products, Inc.* Stipulation of dismissal without prejudice filed Mar. 10, 1983.

**4,322,805. (See 4,228,399.)**

**4,324,578,** Applied Biochemists, Inc., METHOD OF PREPARING A COPPER COMPLEX FOR USE AS AN ALGAECIDE, **filed** Dec. 14, 1982, D.C., W.D. Wash. (Seattle), Doc. C82-1476C, *Applied Biochemists, Inc.* v. *Argent Chemical Laboratories, Inc., et al.*

**4,343,032,** Cable Electric Products, Inc., LIGHT SENSITIVE ELECTRICAL DEVICE, **filed** Feb. 25, 1983, D.C., N.D. Calif. (San Francisco), Doc. C-83-0897 WWS, *Cable Electric Products, Inc.* v. *Genmark, Inc., also known as Diablo Products Corp.*

**4,347,932,** Clements Industries, Inc., TAG PIN, **filed** Dec. 29, 1982, D.C., S.D.N.Y., Doc. 82-CIV-8673 MP, *Clements Industries, Inc.* v. *A. Meyers & Sons Corp.*

**4,353,320,** Builders Concrete, Inc., UTILITY DISTRIBUTION SYSTEM FOR MARINE FLOATS, **filed** Feb. 16, 1983, D.C., W.D. Wash. (Seattle), Doc. C83-201C, *Builders Concrete, Inc.* v. *Bremerton Concrete Products Co.*

**4,366,143,** Amersham International PLC, ASSAY FOR THE FREE PORTION OF SUBSTANCES IN BIOLOGICAL FLUIDS, **filed** Jan. 3, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 0016, *Amersham International PLC* v. *Travenol Laboratories, Inc.*

**4,368,168,** Dusan Slepsivic, METHOD FOR ENCAPSULATING ELECTRICAL COMPONENTS, **filed** Jan. 11, 1983, D.C., N.D. Calif. (San Francisco), Doc. C-83-0147-MHP, *Dusan Slepsivic* v. *Kras/West Corp.*

**Re. 27,690. (See 3,439,795.)**

**Re. 28,507. (See 3,659,284.)**

**D. 235,238,** A & M Leatherlines, Inc., DISPLAY STAND OR SIMILAR ARTICLE, **filed** Feb. 14, 1983, D.C., S.D.N.Y., Doc. 83-CIV-1132 JES, *A & M Leatherlines, Inc.* v. *Etna Products Co., Inc.*

**D. 238,268,** Charles Strada, MOTORCYCLE EXHAUST PIPE, **filed** Feb. 25, 1977, D.C., N.D. Ill. (Chicago), Doc. 77 C 661, *Charles Strada* v. *AMF, Inc.* Causes shall not be appealed, per order dated Feb. 2, 1982.

**D. 253,752,** Cincinnati Microwave, Inc., RADAR WARNING RECEIVER, **filed** Feb. 15, 1983, D.C., S.D. Ohio (Dayton), Doc. C-3-83-139, *Cincinnati Microwave, Inc.* v. *Larrick's, Inc.* **Same, filed** Mar. 7, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 1574, *Dynascan Corp.* v. *Cincinnati Microwave, Inc.*

**D. 258,252,** Gass Industries, Inc., SUPPORT STAND FOR A HANGING SEAT OR SIMILAR ARTICLE, **filed** Feb. 9, 1983, D.C., N.D. Ala. (Birmingham), Doc. 83-AR-0325-S, *Gass Industries, Inc.* v. *Ensley Mfg., Inc.*

**D. 259,490,** James J. Feuling, FAN HOUSING FOR AN AIR COOLED ENGINE; **D. 259,491, same; D. 261,654, same,** MOUNTING STAND FOR ATTACHING AN ACCESSORY TO AN ENGINE, **filed** Dec. 23, 1982, D.C., E.D. Calif. (Fresno), Doc. CV-F-82-492-REC, *James J. Feuling* v. *Claude's Buggies, Inc., et al.*

**D. 259,491. (See D. 259,490.)**

**D. 261,654. (See D. 259,490.)**

**D. 266,700,** Float To Relax, Inc., ISOLATION CHAMBER, **filed** Feb. 4, 1983, D.C., N.D. Tex. (Dallas), Doc. CA3-83-0207R, *Float to Relax, Inc.* v. *Innerspace Enterprises, et al.*

# PATENT NOTICES

## Certificates of Correction for the Week of May 3, 1983

| | | | |
|---|---|---|---|
| Des. 263,585 | 4,333,846 | 4,352,100 | 4,371,379 |
| 4,114,804 | 4,334,083 | 4,353,116 | 4,371,847 |
| 4,153,677 | 4,338,172 | 4,353,911 | 4,372,414 |
| 4,217,272 | 4,339,157 | 4,354,026 | 4,372,506 |
| 4,235,957 | 4,339,643 | 4,354,069 | 4,372,729 |
| 4,237,301 | 4,340,382 | 4,354,959 | 4,372,756 |
| 4,242,348 | 4,340,674 | 4,356,318 | 4,372,991 |
| 4,254,427 | 4,340,708 | 4,357,114 | 4,373,007 |
| 4,265,737 | 4,341,057 | 4,357,327 | 4,373,156 |
| 4,271,565 | 4,341,613 | 4,357,475 | 4,373,636 |
| 4,274,188 | 4,342,667 | 4,358,745 | 4,373,664 |
| 4,278,969 | 4,344,438 | 4,360,291 | 4,373,704 |
| 4,280,710 | 4,344,538 | 4,360,795 | 4,373,815 |
| 4,297,943 | 4,344,723 | 4,362,204 | 4,373,841 |
| 4,299,772 | 4,345,011 | 4,362,872 | 4,374,161 |
| 4,302,546 | 4,345,033 | 4,364,811 | 4,374,251 |
| 4,305,489 | 4,345,302 | 4,365,334 | 4,374,416 |
| 4,308,559 | 4,345,504 | 4,365,398 | 4,374,471 |
| 4,309,176 | 4,346,120 | 4,365,570 | 4,374,663 |
| 4,310,079 | 4,347,679 | 4,365,783 | 4,374,761 |
| 4,313,598 | 4,347,996 | 4,365,949 | 4,374,867 |
| 4,315,034 | 4,348,360 | 4,365,973 | 4,374,963 |
| 4,319,854 | 4,348,444 | 4,366,771 | 4,374,978 |
| 4,321,570 | 4,348,503 | 4,367,024 | 4,375,042 |
| 4,323,071 | 4,348,566 | 4,367,091 | 4,375,283 |
| 4,325,910 | 4,348,838 | 4,367,192 | 4,375,472 |
| 4,326,523 | 4,349,073 | 4,367,408 | 4,375,551 |
| 4,328,982 | 4,349,503 | 4,369,079 | 4,375,622 |
| 4,330,337 | 4,349,844 | 4,369,770 | 4,375,832 |
| 4,332,343 | 4,350,857 | 4,369,844 | 4,376,035 |
| 4,332,691 | 4,351,218 | 4,370,089 | |
| 4,333,130 | 4,351,946 | 4,370,747 | |

## Disclaimers

Des. 265,187.—*Antoine Raluy,* Bouzel, France. TIRE. Patent dated June 29, 1982. Disclaimer filed Feb. 4, 1983, by the assignee, *Compagnie Generale Des Etablissements Michelin.*

Hereby enters this disclaimer to the claim of said patent.

3,642,894.—*Clarence E. Habermann, Ralph E. Friedrich,* and *Ben A. Tefertiller,* Midland, Mich. CATALYSTS FOR THE HYDRATION OF NITRILES TO AMIDES. Patent dated Feb. 15, 1972. Disclaimer filed Feb. 1, 1983, by the assignee, *The Dow Chemical Co.*

Hereby enters this disclaimer to claims 1–5 of said patent.

4,055,469.—*Roy Eugene Snoke,* Webster; and *Gerald Wayne Klein,* Pittsford, N.Y. PURIFICATION OF MICROBIAL ENZYME EXTRACTS USING SYNTHETIC POLYELECTROLYTES. Patent dated Oct. 25, 1977. Disclaimer filed Feb. 15, 1983, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

4,154,568.—*Robert M. Kendall,* Sunnyvale; and *John P. Kesselring,* Mountain View, Calif. CATALYTIC COMBUSTION PROCESS AND APPARATUS. Patent dated May 15, 1979. Disclaimer filed March 17, 1983, by the assignee, *The United States Environmental Protection Agency.*

Hereby enters this disclaimer to claims 1, 3, 7 and 9 of said patent.

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| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
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| | St. Louis Public Library | (314) 241-2288 Ext. 214, Ext. 215 |
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| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
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| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
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# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF February 19, 1983**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 1-16-81 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 11-20-81 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 7-14-81 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 1-20-82 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 11-12-81 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 4-7-81 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 3-12-81 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 11-24-80 |
| RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating, Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors. | 1-07-81 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 8-25-80 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 1-13-81 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 5-18-81 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking: Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 5-18-81 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 2-13-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 11-17-80 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 9-12-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during February 1983, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents** ..... Numbers 3,231,896 to 3,237,200, inclusive

**Plant Patents** ..... Numbers 2,591 to 2,605 inclusive

# REEXAMINATIONS

## MAY 3, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 3,811,830 (80th)**
**STABLE OIL-IN-WATER EMULSION HAIR DYE COMPOSITION**
**Richard DeMarco, Cedar Heights, Conn., assignor to Clairol Incorporated, New York, N.Y.**
**Reexamination Request No. 90/000,212, Jun. 2, 1982.**
**Reexamination Certificate for Patent No. 3,811,830, issued May 21, 1974, Ser. No. 131,426, Apr. 5, 1971.**
**U.S. Cl. 8/405** **Int. Cl.[3] A61K** *7/13*

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5, 9** and **10** having been finally determined to be unpatentable, are cancelled.

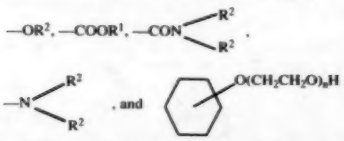
Claims **1, 3, 6, 7, 8** and **11** are determined to be patentable as amended:

Claims **2, 4, 12** and **13**, dependent on amended claims, are determined to be patentable.

**1.** A hair dye composition comprising a stable oil-in-water emulsion in which the discontinuous oil phase is intimately distributed in the aqueous phase; said oil phase comprising about 1 to 4 percent by weight of a water-insoluble oil having dissolved therein or finely dispersed therein about 0.01 to 6 percent by weight of a water-insoluble direct dyeing hair dye; said composition containing about 3 to 18 percent by weight of a coupling agent which is partly soluble both in said oil phase and said aqueous phase whereby stability is imparted to said emulsion; said coupling agent being selected as to type and concentration so as to maintain the solubility of said dye in the aqueous phase below the level at which the dye would have greater affinity for the aqueous phase than the hair during a dyeing operation; said oil phase comprising an oily long-chain fatty derivative selected from the group consisting of compounds of the formula RX in which:

a. R is a long-chain hydrocarbon moiety having 8 to 20 carbon atoms; and

b. X is selected from the group consisting of



$R^1$ is an alkyl radical having 1 to 6 carbon atoms and $R^2$ is hydrogen or $-(CH_2CH_2O)_nH$, n having a value of from 1 to 6, glyceryl monooleate, sorbitan monolaurate, and propylene glycol monostearate; and wherein said coupling agent is a *combination of the following* water-soluble compounds [selected from the group consisting of]:

a. an alkylene glycol or an alkylene glycol ether alochol of the formula:

$$R^5O(R^6O)_nR^7OH$$

wherein $R^5$ is H or alkyl having 1 to 4 carbon atoms and $R^6$ and $R^7$ are divalent alkylene radicals having 2 to 4 carbon atoms and n is a number from 0 to 150;

b. a long-chain fatty acid soap of the formula:

$$(R^8COO)_aM$$

wherein $R^8$ is the hydrocarbon moiety of a long-chain fatty acid having 10 to 20 carbon atoms, M is a monovalent or polyvalent salt-forming group and "a" is the valenace of group M; *and*

c. a long-chain polyoxyalkylated compound selected from the group consisting of a polyoxyalkylated long-chain fatty alcohol, a polyoxyalkylated polyhydroxyalkyl ester of a long-chain fatty acid; a polyoxyalkylated long-chain amine; a polyoxyalkylated long-chain fatty acid; a polyoxyalkylated long-chain fatty acid amide and a polyoxyalkylated long-chain alkyl phenol containing about 8 to 300 oxyalkyl groups in the structure [; and

d. mixtures of said coupling agent].

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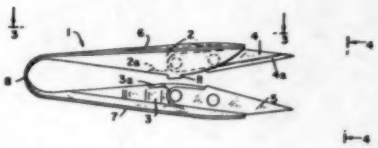
**B1 4,092,776 (81st)**
**CUTTING TOOL**
**William C. Ferguson, Denville, N.J., assignor to Cooper Industries, Inc., Houston, Tex.**
**Reexamination Request No. 90/000,007, Jul. 1, 1981.**
**Reexamination Certificate for Patent No. 4,092,776, issued Jun. 6, 1978, Ser. No. 861,291, Dec. 16, 1977.**
**U.S. Cl. 30/253** **Int. Cl.[3] B26B** *13/18*



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** having been finally determined to be unpatentable is cancelled.

Claims **2–8** determined to be patentable as amended:

**2.** [The cutting tool according to claim 1,] *A cutting tool comprising:*

*(a) one-piece plastic tongs having a substantially U-shaped torsion spring portion and two integral leg portions extending therefrom and terminating in free ends, each said leg portion having a cutting blade mounting surface adjacent said free end:*

*(b) a pair of cooperating, flat, cutting blade members mounted on said cutting blade mounting surfaces and having a cutting surface projecting beyond said free ends, said cutting blade members being oppositely angularly disposed along their length and width with respect to one another as to provide crossover and clearance of said cutting surfaces for a cutting operation; and*

*(c) disengageable stop means operable, when engaged, to limit relative movement of said legs;*

*(d) said tongs having a normal, fully open position in which said stop means is disengaged and said leg portions are urged by said torsion spring portion to their furthest separation, and second and third positions of lesser separation in which said stop means is engaged and said legs are in side-by-side relationship with said mounting surfaces facing one another, the cutting surfaces being exposed for cutting in said second position and not exposed in said third position, the blade members being operable to perform said cutting operation as the legs are moved together from said second position to said third position; and*

*(e) said torsion spring portion being operable to apply torsion forces to said legs to urge said blade members together in cutting relationship as the cutting operation is performed and to return said tongs from said third position to said second position, said stop means, when engaged, stopping the returning legs at said second position*

wherein when said tool is disposed in the second position with one leg beneath the other and said stop means is disengaged, said torsion spring portion is biased to cause relative movement of the upper leg upwardly and across the lower leg so that the legs are separated both horizontally and vertically, and said torsion spring portion is loaded by being distorted as said legs are moved from said open position to said second position.

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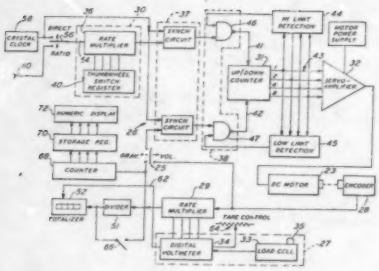
**B1 Re. 30,684 (82nd)**

**DIGITAL MASS FLOW CONTROL SYSTEM**

**Kenneth W. Bullivant, Glassboro, N.J., assignor to K-Tron International, Inc., Glassboro, N.J.**

**Reexamination Request No, 90/000,169, Mar. 1, 1982.**
**Reexamination Certificate for Patent No. Re. 30,684, issued Jul. 21, 1981, Ser. No. 564,965, Apr. 3, 1975.**
**U.S. Cl 222/55** **Int. Cl³ G05G *11/12***



**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT**

The patentability of claims **8–17** and **26–45** is confirmed.

Claims **1–7** were previously cancelled.

New claims **46** and **47** are added and determined to be patentable.

**46.** *A digital mass flow indicator system for use with a motor driven conveyor belt having means for feeding material onto the belt, comprising:*

*weighting means associated with said conveyor belt for producing a digital signal representative of the instantaneous mass of material on said conveyor belt;*

*encoder means associated with said conveyor belt for producing a digital signal in the form of a pulse train whose instantaneous frequency is representative of the instantaneous rate of movement of said conveyor belt;*

*digital rate multiplier means responsive to the digital signals produced by said weighing means and said encoder means for producing a digital signal in the form of a pulse train, each pulse in said train representing an instantaneous increment of mass on said belt, the frequency of said pulse train representing instantaneous mass flow;*

*means for scaling the pulse train digital signal produced by said multiplier means to produce a digital signal pulse train in which each pulse is representative of an increment of mass delivered by said conveyor belt in predetermined dimensions;*

*said weighing means including a transducer for producing an analog signal representative of the instantaneous mass of material on said belt, and an analog-to-digital converter having a storage register whose contents constitute a digital representation of the instantaneous mass of material on said belt;*

*said multiplier means comprising a rate multiplier having a pulse input terminal and level input terminals said pulse input terminal being connected to the output of said encoder means, and said level input terminals being connected to said storage register of said converter, the output of said multiplier being a digital signal representative of the instantaneous actual mass flow rate of material on said conveyor belt;*

*a counter for counting the pulses produced by said scaling means whereby the state of said counter represents the total mass of material passed by said conveyor belt; and*

*means for adjusting the contents of said storage register of said converter to zero for a predetermined input to said converter to provide a tare control.*

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**Errata**

The disposition of claims for the Reexaminations published in the Mar. 29, 1983 Patent Official Gazette, 1028, No. 5, not originally shown, are presented as follows:

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**B1 4,048,544(65th)**

**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:**

The patentability of claims 10 and 11 is confirmed.
Claim 1 is determined to be patentable as amended.
Claims 2–9, dependent on an amended claim, are determined to be patentable.

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**B1 4,182,755 (66th)**

**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:**

Claims 1–9 and 19, having been finally determined to be unpatentable, are cancelled.
Claims 10 and 20 are determined to be patentable as amended.
Claims 11–18, dependent on amended claims, are determined to be patentable.
New claim 21 is added and determined to be patentable.

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**B1 4,031,289 (67th)**

**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:**

Claims 3, 5, 11, 12, 14–17, 19 and 26, having been finally determined to be unpatentable, are cancelled.
Claims 1, 4, 6, 13 and 18 are determined to be patentable as amended.
Claims 2, 7–10, 20–25 and 27–32, are dependent on amended claims, are determined to be patentable.
New claims 33–64 are added and determined to be patentable.

# DEFENSIVE PUBLICATIONS

## PUBLISHED MAY 3, 1983

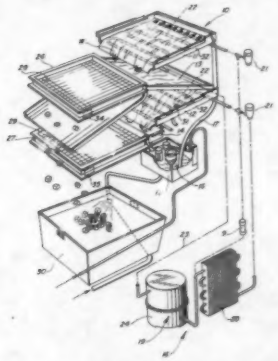
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

### T103,001
### SLAB-TYPE ICE MAKER CONTROL

**James R. Marks, 720 Oxborough Dr., Perrysburg, Ohio 43551**

**Filed Jul. 6, 1982, Ser. No. 395,360**
**Int. Cl.³ G01K *13/00***
**U.S. Cl. 62—139**
**3 Sheets Drawing. 24 Pages Specification**



A control for use in a slab-type ice maker wherein slabs of ice are formed on refrigerated plates by the circulation of water thereover. The control includes sensors for detecting the thickness of the slabs on the plates and causing termination of the ice forming cycle and initiation of an ice transfer or harvest cycle wherein the plates are heated, permitting the slabs of ice to pass downwardly therefrom onto cutting grids for cutting of the ice slabs into a plurality of smaller ice bodies. The sensors utilize a small current detected when the ice slab reaches a preselected thickness as a signal for effecting the automatic operation. Further sensors are associated with the cutting grids for detecting the presence of ice slabs thereon. The control functions to prevent termination of the ice making cycle until such time as at least one of the cutting grids has no ice thereon. The control further continues the harvest cycle in the event less than all of the cutting grids have ice transferred thereto during the harvest cycle. After a preselected period of time, the harvest cycle is terminated regardless of whether or not ice has been transferred to all of the cutting grids and ice forming operation is re-initiated.

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### T103,002
### POLYESTER PRIMER FOR ADHESIVELY BONDED SUBSTRATES

**Frederick D. Petke, 1426 Watauga St., Kingsport, Tenn. 37664**

**Continuation-in-part of Ser. No. 172,914, Jul. 28, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,492**
**Int. Cl.³ C08F *265/04*; C08L *67/02*; C08F *267/00***
**U.S. Cl. 524—605**
**No Drawing. 9 Pages Specification**

Disclosed are primer compositions for enhancing the adhesion of hot-melt adhesives to substrates comprising a copolyester of at least 50 mole percent terephthalic acid, about 10–90 mole percent 1,4-butanediol or 1,6-hexanediol, and a solvating amount of a volatile solvent, the copolyester having an I.V. of about 0.3–1.5 dl/g and a melting point of about 100°–200° C.

# REISSUES

## MAY 3, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### Re. 31,224

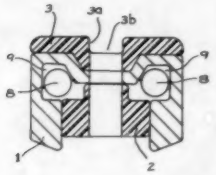
### METAL-PLASTIC COMPOSITE RACQUET

Robert E. Rodgers, Jr., Houston, Tex., assignor to Lesch Industries, Inc., San Diego, Calif.

Original No. 4,066,260, dated Jan. 3, 1978, Ser. No. 732,656, Oct. 15, 1976. Application for reissue Oct. 22, 1979, Ser. No. 87,034

Int. Cl.³ A63B *49/10*

U.S. Cl. 273—73 C 19 Claims




*8. In a game racquet, a composite metal and plastic frame formed intermediate its ends into a head defining a stringing section and having its opposite ends adjacently side by side for defining a handle section, said frame comprising a preformed metal strip, a solid preformed synthetic plastic core member, and an outer preformed strip of synthetic plastic, said core member and said metal strip being substantially coextensive in length, said metal strip being of generally U-shape in cross section to define an inwardly open channel having an outer wall and inwardly extending side walls, the lower edges of said side walls each having an integral continuous reinforcing and thickening rib along the inner surfaces thereof partially closing the channel and imparting rigidity to the composite frame, said core member being disposed wholly within said channel and extending between and being surface bonded directly to the inner sides of said ribs and said outer strip being surface bonded directly upon the outer side of said outer wall, said outer plastic strip extending laterally to protectively cover the outer surface of said channel outer wall and extending longitudinally around the end of said stringing section opposite the handle section, whereby said bonded strips mutually contribute to provide a laminated structure of increased rigidity and energy absorbing characteristics, and means providing in the stringing section a series of aligned stringing holes extending through said core member and said strips.*

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### Re. 31,225

### SINGLE SWITCH ARRANGEMENT FOR ADJUSTING THE TIME BEING DISPLAYED BY A TIMEPIECE

Alan E. Willis, Stamford, Conn., and Paul Suppa, Somers, N.Y., assignors to Timex Corporation, Waterbury, Conn.

Original No. 3,953,964, dated May 4, 1976, Ser. No. 545,846, Feb. 13, 1975. Application for reissue Apr. 27, 1979, Ser. No. 34,083

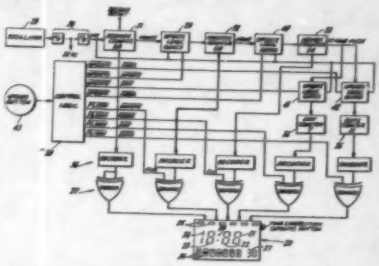
Int. Cl.³ G04C *17/00, 9/00*

U.S. Cl. 368—70 3 Claims

5. A digital electronic timepiece having an electrooptical display consisting of a series of individual display indicia for separate time intervals being coupled to timekeeping circuit means comprising:

a manually operated push-button switch means;

control circuit means operated by said push-button switch means and coupled to said display indicia and said timekeeping circuit means for effecting sequential visual flashing of the display indicia by the push-button switch means being first held depressed, said control circuit means effects prolonged flashing of a selected indicia by the push-button switch means being first released, said control circuit means effects a change to the separate time interval being displayed by the flashing indicia by the push-button switch means being secondly held depressed, said control



circuit means effects an end to the changing of the time interval selected for change and returns the timepiece to a normal timekeeping mode by the push-button switch means being secondly released when the selected time interval is being displayed.

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### Re. 31,226

### 4-TRIFLUOROMETHYL-2,6-DINITROANILINES

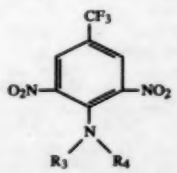
Quentin F. Soper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,403,180, dated Sep. 24, 1968, Ser. No. 587,699, Oct. 19, 1966. Continuation-in-part of Ser. No. 314,510, Oct. 7, 1963, Pat. No. 3,332,769, and Ser. No. 485,060, Sep. 3, 1965, abandoned, which is a continuation-in-part of Ser. No. 243,631, Dec. 10, 1962, Pat. No. 3,257,190, which is a continuation-in-part of Ser. No. 53,066, Aug. 31, 1960, abandoned. Application for reissue Feb. 15, 1978, Ser. No. 877,929

Int. Cl.³ C07C *87/60*; E05B *63/14*

U.S. Cl. 564—441 2 Claims

1. A compound represented by the following formula:




wherein $R_3$ is [$C_2$–$C_4$ alkyl, allyl, or] hydrogen; [$R_4$ is methyl, ethyl, n-propyl, n-butyl, iso-butyl or allyl when $R_3$ is either $C_2$–$C_4$ alkyl or allyl;] and $R_4$ is 2-pentyl or 3-pentyl [when $R_3$ is hydrogen; the sum of the carbon atoms in the groups represented by $R_3$ and $R_4$ being greater than 3].

Re. 31,227

## 4-TRIFLUOROMETHYL-2,6-DINITROANILINES

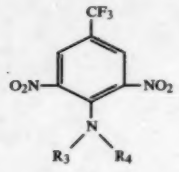
**Quentin F. Soper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Original No. 3,403,180, dated Sep. 24, 1968, Ser. No. 587,699, Oct. 19, 1966. Continuation-in-part of Ser. No. 314,510, Oct. 7, 1963, Pat. No. 3,332,769, and Ser. No. 485,060, Sep. 3, 1965, abandoned, which is a continuation-in-part of Ser. No. 243,631, Dec. 10, 1962, Pat. No. 3,257,190, which is a continuation-in-part of Ser. No. 53,066, Aug. 31, 1960, abandoned. Application for reissue Feb. 15, 1978, Ser. No. 877,930**

**Int. Cl.**[3] **C07C** *87/60*; **E05B** *63/14*

**U.S. Cl. 564—441** **2 Claims**

1. A compound represented by the following formula:



wherein $R_3$ is [$C_2$–$C_4$ alkyl, allyl, or hydrogen] *ethyl, n-propyl, n-butyl, or allyl*; $R_4$ is methyl, ethyl, n-propyl, n-butyl, [iso-butyl] or allyl [when $R_3$ is either $C_2$–$C_4$ alkyl or allyl; and $R_4$ is 2-pentyl or 3-pentyl when $R_3$ is hydrogen]; the sum of the carbon atoms in the groups represented by $R_3$ and $R_4$ being greater than 3.

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Re. 31,228

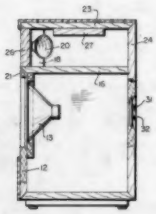
## LOUDSPEAKER SYSTEM

**Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.**

**Original No. 3,727,004, dated Apr. 10, 1973, Ser. No. 115,237, Feb. 16, 1971. Continuation of Ser. No. 762,018, Jan. 24, 1977, abandoned, which is a continuation of Ser. No. 544,963, Jan. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 690,695, Dec. 4, 1967, Pat. No. 3,582,553. Application for reissue Nov. 30, 1979, Ser. No. 98,995**

**Int. Cl.**[3] **H04R** *1/20*

**U.S. Cl. 179—1 E** **25 Claims**



*22. A loudspeaker system comprising,*

*cabinet means for supporting loudspeaker drivers and having a front panel perpendicular to side panels,*

*first loudspeaker driver means supported by said cabinet on said front panel for radiating sound energy to the front directly into the listening area before reflection from a reflecting surface over a first frequency range and having a first polar response,*

*second loudspeaker driver means supported by said cabinet for radiating sound energy to the side for reflection first from a reflecting surface and then into the listening area along a path after reflection that intersects a plane perpendicular to said front panel and parallel to said side panels in said listening area over a second frequency range mostly higher than said first frequency range and having a second polar response different from said first polar response,*

*the axis of said second loudspeaker driver means being generally parallel to a normally vertical plane that bisects the angle between said front and side panels,*

*an input terminal pair,*

*and means for intercoupling said input terminal pair and said first and second loudspeaker driver means for providing spectral components in a common frequency range to said first and second loudspeaker driver means so that the difference between the frequency response of energy radiated by said first loudspeaker driver means and the frequency response of energy radiated by said second loudspeaker driver means in said common frequency range is not appreciable,*

*said means for intercoupling coacting with said first and second loudspeaker driver means to comprise means for dissimilarly radiating from first and second locations defined by said first and second loudspeaker driver means respectively spectral components over said common frequency range to provide a spatially diffuse source,*

*said common frequency range being at least half an octave.*

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Re. 31,229

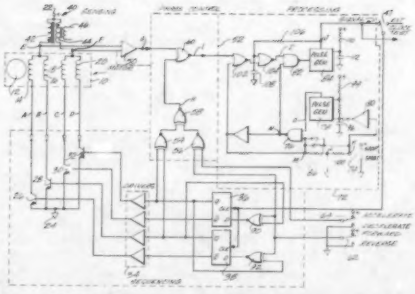
## STEPPING MOTOR CONTROL

**Kenyon M. King, 7520 Cerrito Roja, Cucamonga, Calif. 91730**

**Original No. 4,136,308, dated Jan. 23, 1979, Ser. No. 828,541, Aug. 29, 1977. Application for reissue Feb. 14, 1980, Ser. No. 121,458**

**Int. Cl.**[3] **H02K** *29/00*

**U.S. Cl. 318—696** **14 Claims**



1. A commutation circuit for a brushless DC motor of a type having a permanent magnet rotor and four stator windings energized by switching the windings in sequence across a DC power source, the commutation circuit comprising a transformer having a first winding connected in series with two of the stator windings and the power source and having a second winding connected in series with the other two stator windings and the power source, [means comparing the voltages across the two windings for generating an output pulse when the two voltages are equal] *voltage comparing means for generating an output pulse when the two voltages compared are substantially equal, means connecting the respective transformer windings to the voltage comparing means,* and means for switching the stator windings in response to the output pulses of said comparing means.

**Re. 31,230**

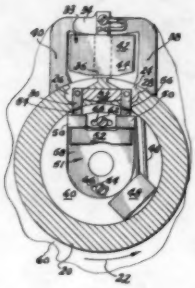
## BREAKERLESS FLYWHEEL MAGNETO IGNITION SYSTEM

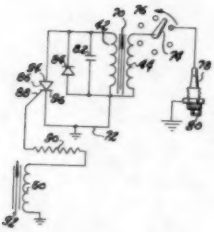
**Thomas E. Swift, West Springfield; Elwin J. Brayley, East Longmeadow, and Ray C. Noddin, Chicopee, all of Mass., assignors to Eltra Corporation, Toledo, Ohio**

**Original No. 3,405,347, dated Oct. 8, 1968, Ser. No. 491,805, Sep. 30, 1965. Continuation-in-part of Ser. No. 469,076, Jul. 2, 1965, abandoned. Application for reissue Nov. 5, 1979, Ser. No. 91,292**

**Int. Cl.³ H05B *41/36*; H02K *11/00*; H02P *9/00***

**U.S. Cl. 322—91** **9 Claims**





*16. In a magneto system including stator means, rotor means cyclically movable relative to said stator means and a magneto-electric assembly including armature means on said rotor means and magnetically coupled first and second winding means on said stator means, said armature means inducing voltages in said first and second winding means as said rotor moves relative to said stator means, the improvement comprising a solid-state threshold device having conductive terminals connected across said first winding means and a trigger coil means mounted on said stator means and providing a timed bipolar cyclical electrical signal in response to movement of said rotor means, said trigger coil means being electrically connected to said threshold device to render said threshold device conductive at an initial time in the cycle of movement when said signal is of one polarity and substantially nonconductive at a predetermined later time during said cycle of said rotor when said polarity is reversed, said solid state threshold device having characteristics such that it remains nonconductive until said trigger coil means renders it conductive in a subsequent cycle, a high-voltage impulse being generated in said second winding means in response to said timed electrical signal rendering said solid-state threshold device nonconductive, said trigger coil means including a first trigger coil and a second trigger coil, each providing a bipolar signal to said threshold device, said threshold device being rendered nonconductive at low rates of rotor movement in response to the combined energy of said coils, the signal of one of said coils terminating conduction through said threshold device at an advanced time in said cycle for increased rates of rotor movement.*

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**Re. 31,231**

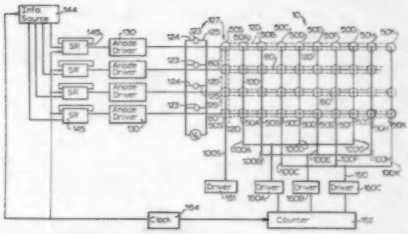
## PANEL-TYPE DISPLAY DEVICE

**James A. Ogle, Neshanic Station, and George E. Holz, North Plainfield, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.**

**Original No. 3,989,981, dated Nov. 2, 1976, Ser. No. 487,955, Jul. 12, 1974. Continuation of Ser. No. 255,133, May 19, 1972, abandoned, which is a continuation of Ser. No. 850,984, Aug. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 828,793, May 28, 1969, abandoned. Application for reissue May 27, 1980, Ser. No. 153,536**

**Int. Cl.³ G09G *3/28***

**U.S. Cl. 340—769** **44 Claims**



**1.** A display system including

a display panel having a plurality of discrete gas-filled display cells arrayed in rows and columns in a layer and adapted to be energized to display a character or message,

electrode means associated with each display cell for applying potential thereto suitable for ionizing the gas in a cell and thereby causing a cell to ionize and to exhibit glow,

a plurality of particle-supply cells arrayed in rows and column in a second layer in said panel, each particle-supply cell being vertically aligned with a display cell so that it can supply excited particles thereto whereby the turn-on of a display cell is facilitated, and

gas communication paths in said panel between adjacent columns of particle-supply cells through which excited particles diffuse from one cell which is exhibiting glow to another cell which is not exhibiting glow, said particles being present within the gas in said other cell and providing an ionization-assisting force to said other cell to cause said other cell to ionize and exhibit glow when operating potentials are applied to it[.],

*all of the cells in each column of particle-supply cells being turned on as each column of particle-supply cells is energized in a scanning cycle of operation, said electrode means being adapted to apply information signals to and to turn on selected display cells in each column thereof as the associated column of particle-supply cells is turned on.*

# PLANT PATENTS

## GRANTED MAY 3, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**5,044**

**ROSE PLANT**

**F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.**

**Filed Oct. 1, 1981, Ser. No. 307,380**

**Int. Cl.³ A01H** *5/00*

**U.S. Cl. Plt.—7** **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by unusual, bright Indian orange blooms borne singly and in large sprays (3 to 15 blooms).

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**5,045**

**ROSE PLANT**

**F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.**

**Filed Oct. 1, 1981, Ser. No. 307,378**

**Int. Cl.³ A01H** *5/00*

**U.S. Cl. Plt.—9** **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by attractive Jasper red flowers borne singly and in large sprays.

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**5,046**

**ROSE PLANT—MEIRANDIVAL VARIETY**

**Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.**

**Filed Mar. 17, 1980, Ser. No. 130,753**

**Claims priority, application Netherlands, Apr. 3, 1979, ROO 1000**

**Int. Cl.³ A01H** *5/00*

**U.S. Cl. Plt.—11** **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant of vegetative reproduction, substantially as illustrated and described, characterized by the fact that:

from the physical point of view the plant with bronze green adult wood is erect, forms double flowers which are yellowish-white in color suffused with geranium lacquer on the edges, and forms petals which bear a yellow unguis on both surfaces; and

from the biological point of view the plant has vigorous vegetation, exhibits nearly continuous flowering under glass, and forms flowers of long duration both on and off the plant.

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**5,047**

**GRAPEVINE**

**John M. Garabedian, P.O. Box 7883, Fresno, Calif. 93747**

**Filed Oct. 26, 1981, Ser. No. 314,704**

**Int. Cl.³ A01H** *5/03*

**U.S. Cl. Plt.—47** **1 Claim**

1. A new and distinct variety of grapevine, substantially as illustrated and described, characterized by its general resemblance to the Thompson Seedless grapevine (unpatented) in bearing elongated, seedless, light green grapes, but being distinguished therefrom and characterized as to novelty by bearing grapes which, without girdling or the application of a growth regulator, are of a size only attained in the Thompson Seedless variety by girdling and/or such application and which are borne in bunches which are substantially free from shattering even when held for a protracted period.

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**5,048**

**CHRYSANTHEMUM NAMED PINK CHIFFON (SP6-267-P)**

**Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan American Plant Company, Parrish, Fla.**

**Filed Oct. 19, 1981, Ser. No. 312,885**

**Int. Cl.³ A01H** *5/00*

**U.S. Cl. Plt.—74** **1 Claim**

1. A new and distinctive pink daisy-type chrysanthemum, substantially as herein shown and described, particularly characterized by its rapid response, vigorous growth habit, and its profuse production of blooms.

# PATENTS

## GRANTED MAY 3, 1983

### ERRATA

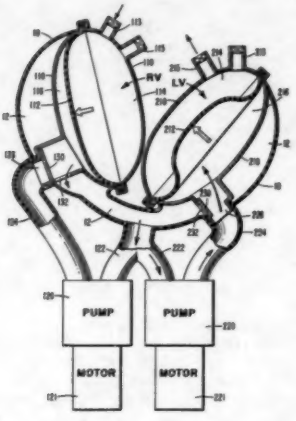
| For CLASS | See PATENT NO. |
|---|---|
| 009–304 | 4,381,696 |
| 009–353 | 4,381,697 |
| 604–006 | 4,381,775 |
| 604–317 | 4,381,776 |
| 604–188 | 4,381,777 |
| 604–191 | 4,381,778 |
| 604–202 | 4,381,779 |
| 604–892 | 4,381,780 |
| 604–372 | 4,381,781 |
| 604–368 | 4,381,782 |
| 604–368 | 4,381,783 |
| 604–368 | 4,381,784 |
| 494–053 | 4,381,849 |
| 436–535 | 4,381,921 |
| 422–098 | 4,381,922 |
| 419–023 | 4,381,924 |
| 203–080 | 4,381,973 |
| 148–020 | 4,381,995 |
| 436–537 | 4,382,074 |
| 436–531 | 4,382,076 |
| 423–150 | 4,382,082 |
| 377–017 | 4,382,178 |
| 377–020 | 4,382,179 |
| 378–037 | 4,382,184 |
| 377–060 | 4,382,193 |

# PATENTS

## GRANTED MAY 3, 1983

## GENERAL AND MECHANICAL

**4,381,567**
**HYDRAULICALLY ACTUATED TOTAL CARDIAC PROSTHESIS WITH REVERSIBLE PUMP AND THREE-WAY VENTRICULAR VALVING**
**Thomas C. Robinson, and Sotiris Kitrilakis, both of Berkeley, Calif., assignors to Foxcroft Associates, San Antonio, Tex.**
**Filed Sep. 15, 1981, Ser. No. 302,596**
**Int. Cl.³ A61F *1/24*; A61M *1/03***
**U.S. Cl. 3—1.7** **18 Claims**




**1**. An implantable hydraulically actuated total cardiac prosthesis comprising:

a pair of blood pumping chambers each having a blood inlet, a blood outlet and a flexible portion;

a pair of actuation chambers each adapted to contain actuation fluid, one of said actuation chambers being operatively associated with one of said blood pumping chambers and the other of said actuation chambers being operatively associated with the other of said blood pumping chambers to cause displacement of the flexible portion of said blood pumping chambers in response to changes in volume of actuation fluid in their associated actuation chambers;

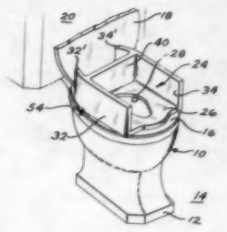
an actuation fluid reservoir;

actuation fluid pumping means in fluid communication with said reservoir for pumping actuation fluid therefrom;

three-way valve means associated with one of said actuation chambers, said valve means being in fluid communication with its associated actuation chamber, said pumping means and said reservoir, and being adapted to alternately and repetitively direct actuation fluid from said pumping means to its associated actuation chamber and then from its associated actuation chamber to said reservoir; and

reversible pump means in fluid communication with the other actuation chamber and said reservoir for alternately and repetitively directing actuation fluid from said reservoir to its associated actuation chamber, and then from its associated actuation chamber to said reservoir.

**4,381,568**
**COMBINATION POTTY SEAT AND STEP STOOL**
**Charles W. Brown, 1053 Reasor Ave., Louisville, Ky. 40217**
**Filed Dec. 16, 1981, Ser. No. 331,041**
**Int. Cl.³ A47K *13/06***
**U.S. Cl. 4—239** **5 Claims**




**1**. A combination children's potty seat and step stool comprising:

(a) a seat portion and a pair of opposite side arm portions, the seat portion including a central opening that is adapted to be aligned over the top opening of a toilet bowl when the potty seat is positioned on the toilet bowl;

(b) and mounting means associated with the underside of the seat portion near the rear of the seat portion for mounting the potty seat to the toilet bowl in a locked position so the potty seat is safe from accidental displacement from the toilet bowl;

(c) the rear edge of the said seat portion having a large cutout so that when the potty seat is inverted and positioned on the floor closely adjacent the front of the toilet bowl, the said cutout will receive the base of the toilet bowl therein and accommodate a child to stand on the inverted potty seat in the manner of a step stool.

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**4,381,569**
**ADJUSTABLE DRAIN PLUG**
**J. Richard Ingram, 1084 Village Rd., Stone Mountain, Ga. 30088**
**Filed Aug. 13, 1981, Ser. No. 292,677**
**Int. Cl.³ A47K *1/14***
**U.S. Cl. 4—295** **9 Claims**

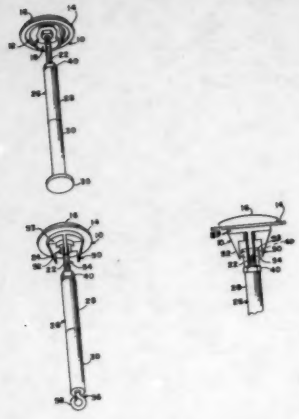
**1**. In a drain plug to be used in a sink, lavatory or the like which includes a drain opening and a drain pipe therein, sometimes called a "Pop-up" drain, and which may also include a conventional control member for actuating the drain plug:

a drain stopper constructed from plastic, rubber or other similar material and having an open interior, said stopper having a gasket thereon comprising a peripheral flange extending outwardly from said stopper,

a cover over said gasket,

a threaded member having one end attached to the bottom of said cover and extending outwardly from said stopper,

a drain member threadedly engaging the other end of said threaded member and being threadedly mounted thereon



for adjustment toward or away from said cover including adjustment into the open part of said stopper.

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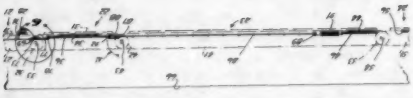
**4,381,570**
**SOFA-BED**
**Charles Schneider, 1040 Whitney Dr., Menlo Park, Calif. 94025**
**Filed Mar. 9, 1981, Ser. No. 241,506**
**Int. Cl.³ A47C *17/04***
**U.S. Cl. 5—13** **16 Claims**



1. A foldable sofa-bed of the type having serially connected deck, cavity, and intermediate sections movable between a folded seat position and a flat unfolded bed position, said deck and intermediate sections being pivotally joined to opposite ends of said cavity section at transverse pivot axes, said deck section being located at a foot end of said sofa-bed and said intermediate section being located at the head end of said sofa-bed and said cavity section having a rigid transverse anchor extending between opposite sides thereof,

said deck section having a transverse rail at the foot end thereof and a deck fabric extending between and secured to said end rail and said cavity section transverse anchor,

a second rigid transverse anchor located at the head end of said intermediate section and an intermediate section fabric extending between and secured at one end to said second transverse anchor and at the opposite end to said cavity section anchor,

the point of attachment of said deck fabric to said cavity section anchor being offset relative to the pivot axis between said deck section and said cavity section and the point of attachment of said intermediate section fabric to said cavity section anchor being offset relative to the pivot axis between said intermediate section and said cavity section such that in seat position of said sofa-bed said deck fabric and said intermediate section fabric each tends to generally assume the position of a hypotenuse of a right triangle and in bed position assume the position of two sides of the right triangle containing said hypotenuse developed in a straight line such that said deck fabric and said intermediate section fabric is each independently drawn taut in bed position and relaxed in seat position.

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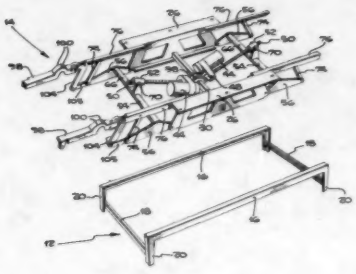
**4,381,571**
**ADJUSTABLE ARTICULATED BED**
**Franklin E. Elliott, Torrance, Calif., assignor to Maxwell Products, Inc., Cerritos, Calif.**
**Filed Feb. 9, 1981, Ser. No. 232,657**
**Int. Cl.³ A61G *7/00***
**U.S. Cl. 5—66** **19 Claims**



1. An adjustable articulated bed having a separate power drive module which may be assembled and disassembled for compact storage, shipment and handling, comprising:

a frame;

an articulated mattress;

said separate power drive module removably nested within said frame to support said articulated mattress;

a pair of central support sections forming the side supports of said power drive module each having an aperture therein whose periphery is provided with an alignment flat;

a lateral support member having a flatted cross section passing through said apertures in said central sections for joining said central sections in alignment with said flats and in parallel alignment with each other;

connecting means having an aperture therein whose periphery is provided with an alignment flat through which said lateral support member passes for aligning said connecting means with said pair of central sections; and

drive motor means mounted upon said connecting means in alignment with said central sections of said power drive module.

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**4,381,572**
**ADJUSTABLE FOOT BRACE**
**Ollibelle Thumberger, 1031 Belle Ave., Hamilton, Ohio 45015**
**Continuation-in-part of Ser. No. 950,566, Oct. 12, 1978, Pat. No. 4,240,170. This application Dec. 22, 1980, Ser. No. 219,232**
**Int. Cl.³ A47C *20/04, 20/02*; A61G *7/06***
**U.S. Cl. 5—444** **8 Claims**

1. An adjustable foot brace adapted for use with a bed, said foot brace comprising

a bed rail mounting bracket adapted to be removably secured to the side rail of a bed frame,

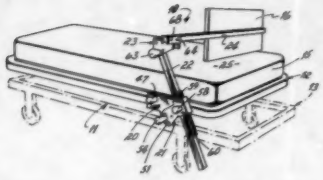
an angularly adjustable carriage supported from said mounting bracket upon a transversely extending pivot for pivotal adjustment in a vertical plane,

a generally vertically extending adjustment bar movable upon said carriage,

an angularly adjustable footboard support bracket pivotally secured to the upper end of said adjustment bar, and

a footboard pivotally secured to said footboard support bracket, said footboard being movable between a first position in which said footboard extends transversely across said bed to a second position in which said foot-

board is pivoted approximately 270° in a plane which extends transversely of said bed so that said footboard



hangs generally vertically downwardly alongside said bed frame from said footboard support bracket in said second position .

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**4,381,573**

## SHOE UPPER CONFORMING MACHINE

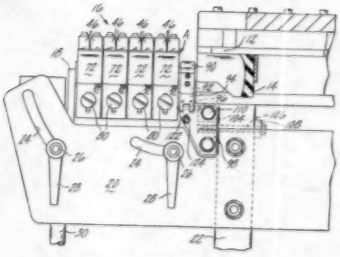
**James R. Flanders, Blaby; David W. Halford, Birstall, and John F. Carr, Sileby, all of England, assignors to USM Corporation, Farmington, Conn.**

**Filed Jul. 2, 1981, Ser. No. 279,882**

**Claims priority, application United Kingdom, Jul. 2, 1980, 8021731**

**Int. Cl.³ A43D *21/00***

**U.S. Cl. 12—12** **14 Claims**



1. A shoe upper conforming machine for use in lasting side portions of shoes comprising:

a last support for supporting a shoe last on which a shoe upper and an insole are positioned;

clamping means, comprising two pad members disposed one at each side of the last support and arranged to engage a shoe upper at opposite sides thereof and to clamp it against its last supported by the last support;

drive means for moving said pad members towards the last support to engage and clamp an upper as aforesaid; and

a pair of side lasting assemblies arranged so as to act on opposite side portions of the upper clamped as aforesaid to wipe marginal portions of said upper over and press them against corresponding marginal portions of the insole, wherein the pad members are arranged to engage the upper as aforesaid each at a position spaced from the feather line of the shoe under the action of the drive means, the pad members being mounted in such a manner that continued operation of the drive means after the engagement of the pad members with the upper is effective to urge the pad members heightwise of the last towards said feather line, so that any excess material in the upper is urged towards the lasting margin thereof and the upper is thus caused to lie snugly about its last prior to the operation of the side lasting assemblies.

**4,381,574**

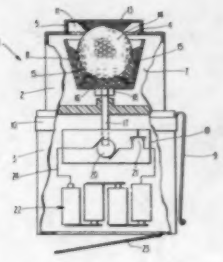
## PORTABLE GOLF BALL WASHER

**Michael Benkovsky, Lee Park Towers, Apt. 622, Wilkes Barre, Pa. 18702**

**Filed Dec. 15, 1981, Ser. No. 331,075**

**Int. Cl.³ A63B *47/04***

**U.S. Cl. 15—97 R** **5 Claims**



1. A portable golf ball washing apparatus comprising

a. a case having a lower section and an upper section;

b. a ball receptacle defined in said upper which is accessible from the top of said upper section;

c. a hinged door on said upper section which seals said receptacle when closed;

d. a generally cylindrical, water-tight ball holder rotatably mounted in said receptacle and accommodatingly larger than a golf ball;

e. a liquid-retaining foam liner mounted within said ball holder;

f. a motor mounted in the lower section of said case;

g. means for transmitting said motor rotation to said ball holder;

h. a power source electrically connected to said motor by a circuit;

i. a switch in said circuit; and

j. means for restraining the motion of a golf ball placed in the holder whereby the liner can move over the surface of the ball when the holder rotates.

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**4,381,575**

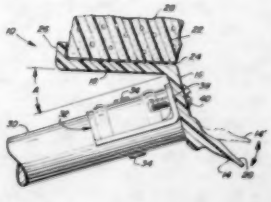
## SQUEEGEE/SPONGE DEVICE WITH DUAL DUROMETER

**Jon R. Wendt, Mt. Prospect, Ill., assignor to Greenview Manufacturing Company, Chicago, Ill.**

**Filed Oct. 2, 1981, Ser. No. 307,733**

**Int. Cl.³ A47L *1/08***

**U.S. Cl. 15—121** **2 Claims**



1. A device comprising:

an elongated body which generally defines three planes: a generally planar squeegee blade, an opposed planar sponge carrying platform and a planar, central connecting portion, the body being formed of an extruded unitary member of synthetic resinous material cut to a desired length and the

material of the squeegee blade being flexible while the material of the connecting portion and sponge carrying platform is relatively rigid;
an elongate sponge member fastened to the sponge carrying platform; and
a handle secured to the central connecting portion.

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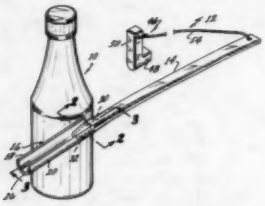
**4,381,576**
**APPLIANCE FOR REMOVING THE CONTENTS OF BOTTLES**

**Richard Nishikawa, 1560 N. Hobart Blvd., Los Angeles, Calif. 90027**

**Filed May 8, 1981, Ser. No. 261,795**
**Int. Cl.³ A47L *17/06***
**U.S. Cl. 15—236 R** **5 Claims**



1. As an article of manufacture: an appliance having a handle member adapted for removing relatively viscous material remaining in a bottle or container having an enlarged body and a relatively restricted neck part, the body having several times the diameter of the neck part, an active element in the form of a channel member affixed to the end of the handle member, the active element being formed of relatively flexible material and configurated to form a channel having spaced side members and at least one side member adapted to be placed against the inside surface of the bottle and rotated so that the material in the bottle is gathered in the channel member, the channel member being of a size which is substantially that of the restricted neck so that it can be inserted into and withdrawn through the restricted neck of the bottle without displacement of the said spaced side members from their normal configuration, the appliance including a handle having sufficient flexibility that one full side surface of one of said side members can be pressed against the inside surface of the bottle.

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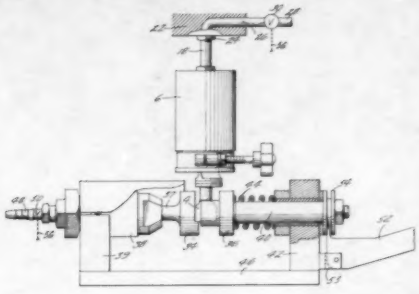
**4,381,577**
**VIBRATOR FOR REMOVING PARTICULATE MATERIAL FROM THE CAVITY OF AN ARTICLE**

**David W. Boye, Northford, and Neil M. Crockett, Meriden, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Sep. 17, 1981, Ser. No. 303,225**
**Int. Cl.³ B08B *5/02***
**U.S. Cl. 15—304** **4 Claims**

1. Apparatus for removing particulate material from internal passages in an article such as a turbine blade or vane, said article having a root at one end and a tip at the other end, said apparatus including supporting means for the article having a recess to receive the tip of the article;
means for releasably clamping the supporting means on said article;
means for supplying air under pressure to said supporting means and thence through the passages in said article;
means for suspending said supporting means and article for relatively free movement;
opposed anvils in spaced relation to one another to engage opposite sides of the root; and
means for imparting a vibratory movement to one of said anvils to vibrate the article, said supporting means being laterally offset from and substantially at right angles to the axis of the vibratory movement of the anvil and being



flexibly held in position such that the vibratory movement is substantially at right angles to the passages in the article.

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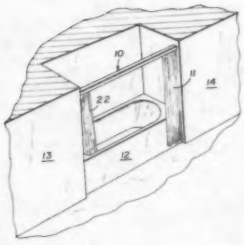
**4,381,578**
**CURTAIN ROD HAVING TENSION MOUNTING MECHANISM**

**Robert G. Glejf, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.**

**Filed Apr. 2, 1981, Ser. No. 250,504**
**Int. Cl.³ A47H *1/022***
**U.S. Cl. 16—94 D** **8 Claims**



1. In combination, a curtain rod and tension assembly adapted to be mounted between two walls, said curtain rod comprising an elongate member having means for mounting a curtain, said tension assembly comprising:
(1) a wall mounting plate adapted to engage a wall in abutting relationship,
(2) a cam member having at least one oblique cam surface and a threaded transverse hole,
(3) a tension plate having means at one end for engaging the end of said curtain rod,
(4) a longitudinal flange provided as an integral part of one member of said wall mounting plate and said tension plate having longitudinal guide means, the other member of said wall mounting plate and said tension plate having complementary guide means slidably engaged with the guide means of said longitudinal flange, said longitudinal flange having a hole provided therein, and
(5) a screw extending through the hole in said longitudinal flange and threadedly engaged in the threaded hole provided in said cam member,
one member of said cam member and said wall mounting plate having a transverse channel provided therein and the other a guide member slidably engaged in said channel,
one member of said cam member and said tension plate having a transverse channel therein and the other having a guide member slidably engaged in said channel,
and at least one member of said wall mounting plate and said

tension plate having a complementary oblique cam surface engaging the oblique cam surface of said cam member, whereby tightening of said screw causes said cam member to move said tension plate away from said wall mounting plate and causes said curtain rod and said tension assembly to become wedged between said walls.

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**4,381,579**

## HANDLE FOR A HAND-HELD DEVICE

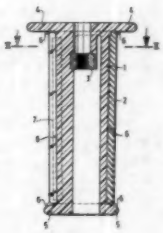
**Gerhard Rumpp, Inning, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein**

**Filed Dec. 12, 1980, Ser. No. 215,650**

**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951886**

**Int. Cl.³ B25G *1/10***

**U.S. Cl. 16—111 R** **2 Claims**



1. Handle for use on a hand-held device, such as a hammer drill, comprising an axially elongated support member arranged to be secured to the hand-held device, said support being formed of a wear-resistant material, an axially extending grip member laterally enclosing at least an axially extending portion of the outer surface of said support member, said grip member being formed of a soft-elastic material forming a gripping surface and providing a damping effect for forces transmitted to the handle from the hand-held device, means formed on and extending radially outwardly from the outer surface of said support member and providing a recess formed in the other surface of the support member with the recess extending circumferentially around and in the axial direction of the support member, said grip member positioned within said recess, and said means projecting radially outwardly beyond the outer surface of said grip member at the opposite ends of said recess, wherein said support member comprising a tubular member, and said means formed on the outer surface of said support member comprising a pair of radially outwardly extending flange-like projections spaced apart in the axial direction of and formed integrally with said support member with radially outer surface of said projections located radially outwardly from the outer surface of said grip member, including means for releasably securing said grip member on said support member, said grip member comprises a sleeve-like member slit in the axial direction thereof from one end to the other, said means for releasably attaching said grip member to said support member comprising a wedge member fitted in said grip member on each side of an extending in the axial direction along the slit, and a web formed on each said wedge member and fitted into a recess in said support member extending therealong in the axial direction thereof, said web of each said wedge member engageable with said support member for securing said grip member on said support member.

**4,381,580**

## VERTICALLY ADJUSTABLE HINGE

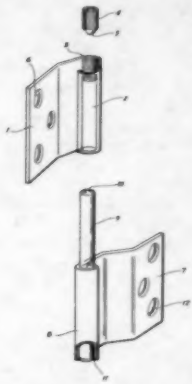
**Eric Hellström, Filipstad, and Lennart Helm, Gothenburg, both of Sweden, assignors to Nykroppaverken AB, Nykroppa, Sweden**

**Filed Feb. 10, 1981, Ser. No. 233,301**

**Claims priority, application Sweden, Feb. 26, 1980, 8001484**

**Int. Cl.³ E05D *7/04***

**U.S. Cl. 16—243** **1 Claim**



1. Hinge construction for doors or the like comprising first and second hinge parts adapted for mounting respectively on a stationary member and a movable member for hingedly mounting said movable member to said stationary member, said first hinge part comprising a first mounting flange, a first sleeve fixed to said first flange, and a hinge pin fixed within said first sleeve and protruding therefrom, said second hinge part comprising a second mounting flange having a rolled edge portion defining a second sleeve, said rolled edge portion terminating in a free edge adjacent the second flange for selective movement relative thereto and a resiliently resisted expansion of the second sleeve due to inherent resiliency of the material of the second hinge part, said second sleeve having opposed open end portions, said first and second sleeves being of substantially the same diameter with the second sleeve adapted to align over the first sleeve with the protruding pin received therein through a first end portion thereof, the second end portion of said second sleeve being internally threaded, a screw element threaded within the second end portion and defining a limit means to the insertion of the pin protruding from the first sleeve, said screw element being longitudinally adjustable within said second end to vary the degree of penetration of the pin into the second sleeve, said screw element being of a size relative to said second end portion as to effect a slight resilient expansion of the second end portion and a corresponding clamping of the screw element therein.

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**4,381,581**

## HINGE MECHANISM

**Josef A. Ludvik, Lyndhurst, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio**

**Filed Mar. 12, 1980, Ser. No. 129,687**

**Int. Cl.³ E05D *7/10, 15/00*; B65D *43/16, 43/24***

**U.S. Cl. 16—259** **15 Claims**

1. A hinge mechanism for a cover of an enclosure comprising, in combination,

a first mounting bracket;

a second mounting bracket; and

a link;

first interconnection means comprising portions of said link and said first bracket;

second interconnection means comprising portions of said link and said second bracket;

one of said mounting brackets having means for fixedly mounting same to an enclosure, and

the other of said mounting brackets having means for fixedly mounting same to a cover which is adapted to cover the enclosure;

said first interconnection means including a first pivot part on said first mounting bracket established along a first pivot axis,

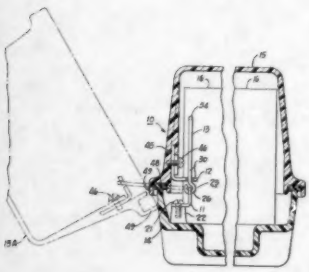
said first interconnection means including a second pivot part on said link pivotally interconnecting with said first pivot part for pivotal movement of said link on said first pivot axis of said first mounting bracket,

said first pivot axis being substantially perpendicular to the length of said link;

one of said second bracket and said link at said second interconnection means including a U-shaped member with first and second generally parallel legs and a bight portion,

one of said second bracket and said link at said second interconnection means including a limit member coacting with one of the ends of said legs of said U-shaped member,

said second interconnection means establishing a sliding connection and at least a limited pivotal connection about



a second pivot axis between said link and said second mounting bracket,

said second pivot axis being substantially perpendicular to the length dimension of said link,

said sliding connection being substantially parallel to the length dimension of said link,

one of said U-shaped and limit members being connected as at least part of said link and the other of said members being connected as at least part of said second mounting bracket,

said limit member adapted to approach said bight portion as one limit of relative sliding movement between said link and said second mounting bracket,

said second pivot axis being at said second mounting bracket and slidable along the length of said U-shaped member,

said U-shaped member being a spring member to establish ready connection and disconnection between said mounting brackets at one of said pivot axes,

said U-shaped member being constructed with relative elasticity between said legs and having feet, serving as a part of said first interconnection means, positioned at said one of said pivot axes, said feet being movable in the plane of said U-shape to establish said ready connection and disconnection between said mounting brackets at said one of said pivot axes.

**4,381,582**

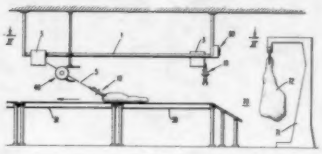
## PLANT AND GRIPPING MEANS FOR CUTTING UP MEAT

**Kaarlo J. Korhonen, Säterivägen 18, S-161 70 Bromma, Sweden**

**Filed Dec. 2, 1980, Ser. No. 212,098**

**Int. Cl.³ A22C *17/02***

**U.S. Cl. 17—44.3** **4 Claims**



1. A plant for cutting up meat comprising a horizontally reciprocable drive means, means carried by said drive means for gripping meat pieces, a work station at one end of the drive means; said drive means comprising two horizontally displaceable members arranged side by side, each member carrying a reel to which a wire is connected, said reel being biased to wind up the wire; each member carrying a separate gripping means comprising two jaws, spring means biasing the jaws towards each other, each gripping means being connected to its associated member via said wire, a U-shaped baffle means being arranged in the movement path of each gripping means; releasable latching means for holding the jaws in open condition, and means for opening the jaws upon engagement between the gripping means and the baffle means; the members being arranged to drive said gripping means in counterphase.

**4,381,583**

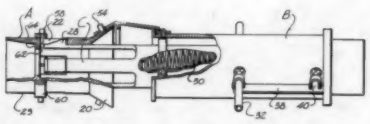
## BEAM CONNECTOR APPARATUS AND ASSEMBLY

**Georg F. von Tiesenhausen, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Oct. 8, 1980, Ser. No. 195,226**

**Int. Cl.³ A44B *21/00***

**U.S. Cl. 24—714** **15 Claims**



1. Apparatus for connecting free ends of a plurality of structural components such as beams and the like comprising:

a first member adapted for being carried by a first of said free ends having a receptacle;

a second member adapted for being carried by a second of said free ends having a housing;

a plurality of spaced window openings formed in said receptacle of said first member;

a connector member slidably carried by said housing of said second member having a plurality of prong means adapted for engagement within said window openings for resisting relative rotational movements between said first and second members;

said connector member having an extended position relative to said housing in which said prong means is engaged in said window openings;

lock means for holding said connector member in a retracted position retracted longitudinally with respect to said extended position; and

actuator means for effecting movement of said connector

member between said retracted and extended positions and connecting said members.

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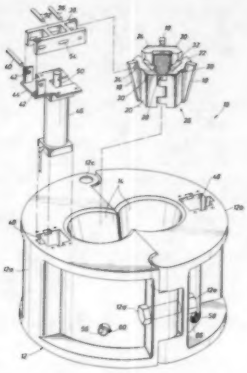
**4,381,584**
**DUAL STRING SPIDER**

William E. Coyle, Sr., Houma, La., assignor to Bilco Tools, Inc., Houma, La.

Filed Dec. 15, 1980, Ser. No. 216,661
Int. Cl.³ A44B *21/00*; E21B *19/07*
U.S. Cl. 24—263 D 3 Claims



1. A dual spider comprising
a body having a pair of tapered bowls extending therethrough with said bowls being open to each other at their inner portions
a set of gripping slips for each bowl,
an actuator for each set of gripping slips
a pair of bars extending across the lower portion of said body below said bowls,
said bars in plan view being substantially perpendicular to each other and intersecting mid way between the centers of said bowls to provide a barrier therebetween, and
means releasably securing the ends of the bars in said body.

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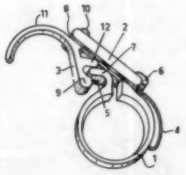
**4,381,585**
**SELF LOCKING CLAMPING COLLAR**

Henri Morel, Maule, France, assignor to ITW de France, Beauchamp, France

Filed Sep. 2, 1980, Ser. No. 182,895
Claims priority, application France, Sep. 6, 1979, 79 22333
Int. Cl.³ F16L *33/12*
U.S. Cl. 24—270 2 Claims



1. An integrally formed self-locking clamping collar, of the type having an overcenter connecting assembly for a split clamping ring having a pair of relatively movable end portions adapted to be drawn and held proximate one another, comprising a split clamping ring having a pair of ends, a lever means, and a buckle means, one of said ends including pivot means for cooperating with said lever means, the other of said ends including a second pivot means adapted for cooperating with a buckle means, said lever means being adapted for drawing and locking said pair of ends proximate one another, said lever means including a bearing end adapted to cooperate with said first pivot means and anchoring means to cooperate with said buckle means, said buckle means including a first end adapted to cooperate with said second pivot means and a second end adapted to be engaged by said anchoring means of said lever means, flexible means attaching said buckle means to said split clamping ring to prevent loss thereof, frangible connecting means connecting said lever means to said split clamping ring whereby said self-locking clamping collar is initially a unitary device and subsequent to its first usage is a multi-part device, and whereby the locking of said clamping collar occurs when a pivot axis established by said bearing end and said first pivot means passes from one side of a line connecting a pivot axis established by said anchoring means and said second end and a pivot axis established by said first end and said second pivot means to the other side thereof.

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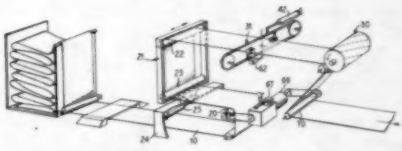
**4,381,586**
**WIDTH CONTROL AND ALIGNMENT MEANS FOR CONTINUOUS EXTENSIBLE WEB**

Norman C. Abler, Menomonee Falls, Wis., assignor to Borg Textile Corporation, Chicago, Ill.

Continuation of Ser. No. 927,006, Jul. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 719,017, Aug. 30, 1976, Pat. No. 4,102,023. This application Aug. 19, 1980, Ser. No. 179,427
Int. Cl.³ D06C *23/02*
U.S. Cl. 26—2 E 16 Claims



1. Control system for web alignment, registration, and longitudinal tensioning along a web path generally aligned relative to a work station which transversely extends across said web path at a preset location therealong, said control system comprising:
(a) a pair of driving roller means, each one located transversely across said web path, one located upstream, the other located downstream, respectively, from said work station, for translating such a web along said web path and also for maintaining a desired longitudinal tension of such a web between respective ones of said pair of driving roller means,
(b) first drive means for driving each of said driving roller means including selectively variable rotational speed control means for differentially rotatably driving one of said driving roller means of said pair at a different surface speed with respect to the other thereof,
(c) a steering frame assembly, including two guide roller means located transversely across said web path upstream from said work station with respect to the direction of web movement along said web path, said steering frame assembly having a pivot axis located centrally relative to said web path and perpendicularly relative to said steering frame assembly for reciprocal arcuate movements of said guide roller means transversely across said web path,
(d) second drive means for reciprocally pivoting said steering frame assembly,
(e) a first and a second position sensing means, located in opposed relationship to one another at opposed sides of said web at a preset longitudinal location therealong, each of said sensing means being movable transversely such that a movement of one toward or away from the other is accompanied by a corresponding movement in the other

and each one of said position sensing means being able to instantaneously sense the spatial position of its related one side edge of said web relative to said one sensor and to generate a position signal representative of such transverse web edge position so sensed,

(f) alignment control means responsive to signal from said first position sensing means and suitable for actuating said second drive means for causing said steering assembly to transversely position said web continuously,

(g) reversible drive means responsive to signal from said second position sensing means for causing said pair of position sensing means to follow transverse width changes in said web and also to follow movements of said web produced by said steering frame assembly,

(h) a third position sensing means cooperating with said first and second sensing means for instantaneously sensing position changes in said first and second sensing means and for generating a third signal representative of the transverse width of said web, and

(i) width control means for comparing said third signal to a constant factor representative of a predetermined width desired for said web and for generating a difference signal representative of any differences sensed, said difference signal being operative for controlling said first drive means for variably and differentially rotatably driving one of said driving roller means with respect to said other driving roller means for thereby causing variations in longitudinal tensioning of the web sufficient to maintain continuously said desired web width.

15. In combination, a contour electrifier and a control system for web alignment, registration and longitudinal tensioning along a web path generally centered relative to a work station in which said contour electrifier is operative and extends transversely across said web path at a predetermined location therealong:

said contour electrifier comprising a rotatable heatable cylinder including journal means therefor, an elongated rest member in adjacent, radially spaced, longitudinally extending relationship to said cylinder, the interrelationship between said cylinder and said rest member further being such that circumferentially outer surface portions of said cylinder vary in a longitudinally repeating manner in their radial spacings from adjacent surface portions of said rest member;

and said control system comprising a pair of driving roller means, each one located transversely across said web path, one located upstream, the other located downstream, respectively, from said work station, for translating such a web along said web path and also for maintaining a desired longitudinal tension of such a web between respective ones of said pair of driving roller means; first drive means for driving each of said driving roller means including selectively variable rotational speed control means for differentially rotatably driving one of said driving roller means of said pair at a different surface speed with respect to the other thereof; a steering frame assembly, including two guide roller means located transversely across said web path upstream from said work station with respect to the direction of web movement along said web path, said steering frame assembly having a pivot axis located centrally relative to said web path and perpendicularly relative to said steering frame assembly for reciprocal arcuate movements of said guide roller means transversely across said web path; second drive means for reciprocally pivoting said steering frame assembly; a first and a second position sensing means, located in opposed relationship to one another at opposed sides of said web at a present longitudinal location therealong, each of said sensing means being movable transversely such that a movement of one toward or away from the other is accompanied by a corresponding movement in the other and each one of said position sensing means being able to instantaneously sense the spatial position of its related one side edge of said web relative to said one sensor and to generate a position signal representative of such transverse web edge position so sensed; alignment control means responsive to signal from said first position sensing means and suitable for actuating said second drive means for causing said steering assembly to transversely position said web continuously; reversible drive means responsive to signal from said second position sensing means to follow transverse width changes in said web and also to follow movements of said web produced by said steering frame assembly; a third position sensing means cooperating with said first and second sensing means for instantaneously sensing position changes in said first and second sensing means and for generating a third signal representative of the transverse width of said web, and width control means for comparing said third signal to a constant factor representative of a predetermined width desired for said web and for generating a difference signal representative of any differences sensed, said difference signal being operative for controlling said first drive means for variably and differentially rotatably driving one of said driving roller means with respect to said other driving roller means for thereby causing variations in longitudinal tensioning of the web sufficient to maintain continuously said desired web width;

whereby said web is substantially accurately guided through said contour electrifier in predetermined registration with said radial spacings in said contour electrifier.

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**4,381,587**

## APPARATUS FOR CORRECTING DEVIATION OF TRAVELLING FABRICS

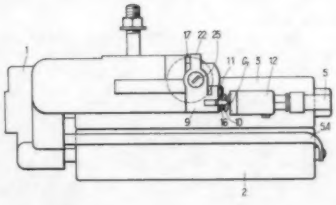
**Hideyuki Cho, c/o Toyo Machinery Co. Ltd., No. 29-6, Zuikodori, Higashiyodogawa-ku, Osaka-shi, Japan**

**Filed Sep. 24, 1980, Ser. No. 190,406**

**Claims priority, application Japan, Oct. 1, 1979, 54-126975**

**Int. Cl.³ D06C** *3/06*

**U.S. Cl. 26—78** **8 Claims**




1. An apparatus for correcting the deviation of a travelling fabric comprising a fixed roller and a movable roller disposed in opposed relation to the fixed roller and movable toward and away from the fixed roller to correct the deviation of the fabric by nipping the fabric when necessary, the apparatus being characterized in that the movable roller is biased by spring means toward the fixed roller for nipping the fabric with the rollers, the movable roller being normally biased away from the fixed roller by cylinder means movable forward and backward by means for detecting a selvage of the fabric, and further comprising a pair of side arms for rotatably supporting the movable roller at the opposite ends of its shaft, an arm shaft disposed in parallel to the movable roller and supporting the side arms, a center arm fitting around the arm shaft, and a transmitting bar fitting in and extending between the side arms and pivoted at the midportion of its length to the center arm, the cylinder means and the spring means being coupled to the center arm to move the movable roller toward and away from the fixed roller through the transmitting bar.

8. An apparatus for correcting the deviation of a travelling fabric comprising a fixed roller and a movable roller disposed in opposed relation to the fixed roller and movable toward and

away from the fixed roller to correct the deviation of the fabric by nipping the fabric when necessary, spring means for biasing the movable roller toward the fixed roller for nipping the fabric with the rollers, cylinder means for normally biasing the movable roller away from the fixed roller, said cylinder means being movable forward and backward by means for detecting a selvage of the fabric, a pair of side arms for rotatably supporting the movable roller at the opposite ends of its shaft, an arm shaft disposed in parallel to the movable roller and supporting the side arms, a center arm fitting around the arm shaft, the cylinder means being provided with means for adjusting the stroke of the cylinder means, and the stroke adjusting means comprising a cam attached to a lever on the center arm and having a groove, a ball engaged in the cam groove and disposed at the forward end of a push rod of the cylinder means, and means for shifting the cam groove relative to the ball to adjust the stroke.

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**4,381,588**

## CONTROLLED DEFLECTION ROLL

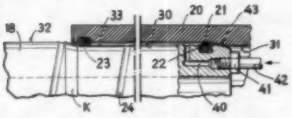
**Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland**

**Filed Jan. 19, 1981, Ser. No. 226,206**

**Claims priority, application Switzerland, Feb. 27, 1980, 1565/80**

**Int. Cl.³ B21B *27/02***

**U.S. Cl. 29—116 AD** **10 Claims**




1. A controlled deflection roll comprising:

a stationary roll support;

a roll shell mounted to be rotatable about the stationary roll support;

said roll shell having an inner surface;

at least one support element for supporting the roll shell upon the stationary roll support;

said support element acting with a pressure force against the inner surface of the roll shell;

said roll shell comprising at least two coaxial elements which can be releasably interconnected with one another;

said at least two coaxial releasably interconnectable elements comprising an inner base body and an outer sleeve member;

respective sealing means provided for at least one end of the base body and at least one end of the sleeve member;

said base body of the roll shell being provided with a channel;

said channel opening into an outer surface of the base body which coacts with an inner surface of the sleeve member of the roll shell;

a source of a pressurized fluid medium connectable with said channel;

said outer surface of the base body containing at least two cylindrical portions having stepped diameters;

said inner surface of the sleeve member being provided with at least two correspondingly configured cylindrical portions possessing stepped diameters and cooperating with related ones of said two cylindrical portions of the base body;

in the undeformed condition of the interconnectable elements of the roll shell the outer diameter of each cylindrical portion of the base body is larger in size by a given overdimension than the inner diameter of each related cylindrical portion of the sleeve member, but the diameter of one portion of the sleeve member containing the larger diameter of such sleeve member being greater than the diameter of a neighboring portion of the base body containing the smaller diameter of the outer surface of such base body;

said sealing means being provided for the base body at its end having the smaller diameter and at the sleeve member at its end having the larger diameter; and

said channel extending behind the related sealing means at said base body.

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**4,381,589**

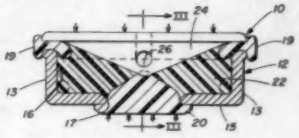
## METHOD OF MANUFACTURING A RESILIENT SIDE BEARING

**Geoffrey W. Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jan. 19, 1981, Ser. No. 225,901**

**Int. Cl.³ B21D *53/10***

**U.S. Cl. 29—149.5 R** **3 Claims**




1. A method of manufacturing a resilient side bearing of the type utilized in the truck and body of a railway vehicle comprising the steps of:

providing the bearing housing;

deformably sealing the bearing housing to form an enclosed bearing chamber;

pouring a liquid resilient bearing material into the bearing chamber;

permitting the liquid resilient bearing material to cure and become bonded to the interior surface of the housing to form the bearing; and

removing the deformable seals after the bearing material has cured.

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**4,381,590**

## METHOD FOR MANUFACTURING A CATALYTIC REACTOR CARRIER MATRIX

**Manfred Nonnenmann, Schwieberdingen; Heinrich Oltmanns, Eberdingen, and Manfred Hohhäusel, Stuttgart, all of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 4, 1980, Ser. No. 156,486**

**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1979, 2924592**

**Int. Cl.³ B23P *15/00*; B23K *1/00, 1/12***

**U.S. Cl. 29—157 R** **12 Claims**

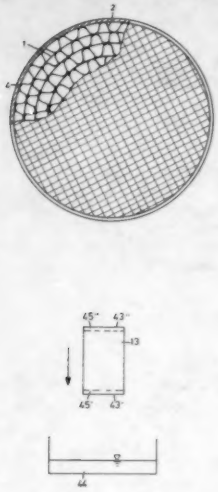
1. In a method for manufacturing a carrier or supporting matrix for a catalytic reactor designed for cleaning or purifying the exhaust gases in an internal combustion engine of a motor vehicle, the reactor comprising high temperature resistant steel sheets coated with a catalyst material, said steel sheets comprising a first relatively flat sheet and a second corrugated sheet alternately disposed in layers, the individual layers of the steel sheets being soldered together, the improvement comprising:

(a) coiling the flat and the corrugated steel sheets to form a cylindrical honeycomb element;

(b) degreasing and/or staining the honeycomb element;

(c) uniformly applying a predetermined amount of solder to one or both end faces of the wound-up honeycomb element so that solder is present only in the vicinity of the

end faces and a substantial length of the honeycomb element intermediate the end faces is free of solder; and



(d) thereafter simultaneously soldering together all the layers with respect to each other by heating up the matrix with soldering taking place only in the vicinity of the end faces.

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**4,381,591**

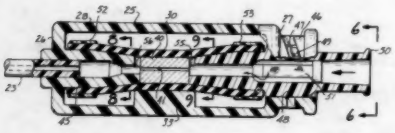
## METHOD OF ASSEMBLING MEDICAL FLUSHING VALVE

**Larry N. Barger, Glendale, and Kenneth R. McCord, Lakewood, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.**

**Division of Ser. No. 32,832, Apr. 24, 1979, Pat. No. 4,267,835. This application Mar. 20, 1981, Ser. No. 245,580**

**Int. Cl.³ B23P *15/00*; A61M *5/00***

**U.S. Cl. 29—157.1 R** **3 Claims**



1. A method of assembling a medical flushing valve comprising the steps of:

(a) sealing a restrictor inside an elastically distortable tube so the restrictor and tube combine to form a flow passage with a predetermined flow rate leaving a portion of the distortable tube extending beyond the ends of the restrictor;

(b) securing one end of the distortable tube to a first hollow connector fixed within a housing, and securing the other end of the distortable tube to a second hollow connector which is movable with respect to the housing by twisting the elastically distortable tube with a torquing force and inserting the movable second hollow connector into the twisted end of the tube; and

(c) compressingly urging the first and second hollow connectors into sealing engagement with the restrictor.

**4,381,592**

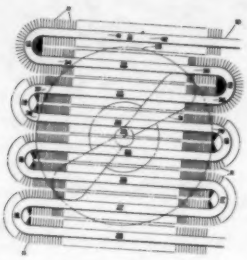
## METHOD OF PRODUCING HELICALLY WOUND SPINE FIN HEAT EXCHANGER

**Herbert J. Venables, III, and Herbert J. Venables, IV, both of Shaker Blvd., Hunting Valley Village, Chagrin Valley Post Office, Ohio 44022**

**Division of Ser. No. 16,799, Mar. 2, 1979, abandoned. This application Apr. 7, 1981, Ser. No. 251,951**

**Int. Cl.³ B23P *15/26***

**U.S. Cl. 29—157.3 AH** **6 Claims**



1. A method of producing helically wound spine fin heat exchangers having a tube wound with spine fin material providing a plurality of separate spines extending from a continuous base portion while reducing the amount of material required to produce such heat exchangers, comprising helically wrapping a substantially straight tube with spine fins having a first helix angle and a first spine fin density along a plurality of spaced first portions and with a second helix angle greater than said first helix angle and a lower spine fin density along intermediate second portions between said first portions, the density of said first portions being selected to provide substantial heat exchange capacity along the parts of said heat exchanger occupied by said first portions, and thereafter bending said tube along said second portions to provide a plurality of substantially straight passes formed at least in part by said first portions, wherein said spine fins are formed of a strip of material which is stretched as it is wound onto said tube, said base portion being stretched a greater amount along said second portions than along said first portions.

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**4,381,593**

## METHOD AND APPARATUS FOR APPLYING TOP END STOPS TO A FASTENER STRINGER CHAIN

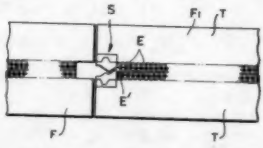
**Keiichi Yoshieda, and Yoshitaka Iimura, both of Kurobe, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan**

**Filed Jul. 31, 1981, Ser. No. 288,939**

**Claims priority, application Japan, Aug. 13, 1980, 55-111344**

**Int. Cl.³ B29D *5/00*; A41H *37/06***

**U.S. Cl. 29—408** **6 Claims**



1. Apparatus for applying top end stops to a fastener stringer chain which comprises:

(a) a base;

(b) a housing mounted on said base and movable in a horizontal direction in which the chain is to travel;

(c) a shaping punch holder movably accommodated within said housing and having a shaping punch movable relatively to said holder;

(d) a seal-cut punch movably accommodated within said housing;

(e) means for driving said holder, said shaping punch and said steel-cut punch relatively to each other;
(f) means for feeding a strip of plastic film to a working station;
(g) a supersonic horn disposed above the working station and operatively associated with said shaping punch and said seal-cut punch to apply said strip to the chain and to sever the applied strip, respectively;
(h) gripper means for advancing the chain a predetermined distance;
(i) a pair of measuring rollers passing the chain therebetween; and
(j) means for clamping the chain tautly between said gripper means and said rollers.

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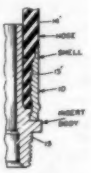
**4,381,594**

**METHOD OF COLD FORMING COUPLING SHELL**

**George A. Levande, and Frederick J. Schwarzenbart, both of Manitowoc, Wis., assignors to Imperial Clevite Inc., Rolling Meadows, Ill.**

**Filed Feb. 17, 1981, Ser. No. 235,348**
**Int. Cl.³ B21K *1/16***
**U.S. Cl. 29—508** **3 Claims**




1. A method of making a permanently attached hose coupling comprising successively drawing a metal blank to form a hollow generally frusto-conical element having a large diameter portion at one end and a small diameter portion at the other end and a stepped interior therebetween characterized by at least one substantially continuous circular discontinuity, assembling a rigid tubular body within a flexible hose and with said element ensleeved about said hose with said smaller diameter end adjacent the hose end, and thereafter radially inwardly deforming said element rendering its shape generally cylindrical so that said at least one circular discontinuity grips into said hose.

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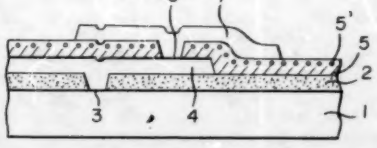
**4,381,595**

**PROCESS FOR PREPARING MULTILAYER INTERCONNECTION**

**Masahiko Denda; Shinichi Sato, both of Itami; Wataru Wakamiya, Amagasaki; Hiroshi Harada, Kawanishi; Natsuro Tsubouchi, and Hirokazu Miyoshi, both of Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 4, 1980, Ser. No. 184,171**
**Claims priority, application Japan, Oct. 9, 1979, 54-130378; Oct. 25, 1979, 54-139136**
**Int. Cl.³ H01L *21/90***
**U.S. Cl. 29—589** **2 Claims**




1. A process for preparing a multilayer interconnection which comprises sequentially forming a first interconnection metal layer, a layer insulating film and a second interconnection metal layer, wherein said interconnection metal layer is made of a low melting metal and said layer insulating film is made of a plasma enhanced chemical vapor deposited nitride film and an oxynitride film is formed on the surface layer of said nitride film so as to prevent mutual diffusion between the second interconnection metal layer and said nitride film.

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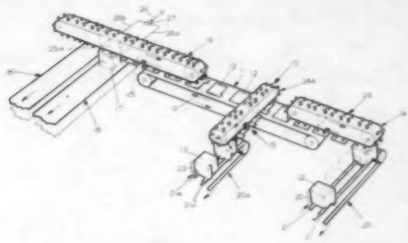
**4,381,596**

**METHOD AND APPARATUS FOR BATTERY PLATE STACKING**

**Robert D. Simonton, Fremont, and Carl D. Schultz, Tiffin, both of Ohio, assignors to Mac Engineering & Equip. Co., Inc., Benton Harbor, Mich.**

**Filed Feb. 4, 1981, Ser. No. 231,003**
**Int. Cl.³ H01M *10/14*; B65G *47/28, 47/91***
**U.S. Cl. ..—623.1** **7 Claims**



1. A method for forming a vertical stack of n positive and n+1 negative battery plates in alternating order with a negative plate positioned on both the bottom and top of the stack, said method comprising the steps of depositing a series of positive plates on a horizontally moving elongated belt in spaced relation to one another and with a spacing longitudinally of the belt between successive positive plates at least equal to two negative plates, depositing a series of negative plates on the belt such that one negative plate of the series of negative plates is deposited between each successive pair of positive plates with each negative plate being located between and in spaced relation longitudinally of the belt to the positive plates in each successive pair, and depositing an additional negative plate on the belt between each pair of positive plates which comprise the last plate of one group of n positive plates and the first plate of the next group of n positive plates, and so that the additional negative plate is located between and in spaced relation longitudinally of the belt to one negative plate and one positive plate.

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**4,381,597**

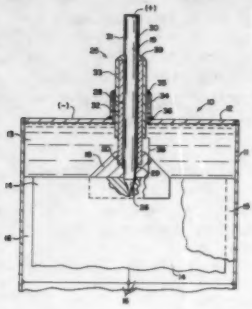
**PROCESS FOR FORMING A SWAGED SEAL FOR FUSED SALT BATTERIES**

**Theodore B. Selover, Jr., Shaker Heights, Ohio, and Thomas H. Hacha, Troy, Mich., assignors to The Standard Oil Company, Cleveland, Ohio**

**Division of Ser. No. 221,390, Dec. 30, 1980, Pat. No. 4,326,016. This application Oct. 23, 1981, Ser. No. 314,140**
**Int. Cl.³ H01M *2/08***
**U.S. Cl. 29—623.2** **21 Claims**

1. A process for forming a seal for fused salt batteries having a current conducting rod between the outside and inside of said battery comprising the steps of:
providing a layer of compressible material over said rod excluding the opposite ends thereof;
swaging a metal sheath over said layer and compressing said layer to approximately its maximum density;

removing a portion of said swaged sheath from said layer of material; and



fastening said swaged metal sheath through a suitable bore in said battery.

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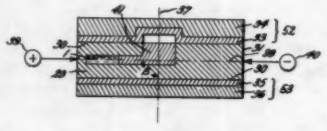
**4,381,598**

## METHOD OF MAKING ANODE AND CATHODE CONNECTIONS FOR ELECTROMIGRATION

**Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 11, 1981, Ser. No. 272,801**
**Int. Cl.³ H01L *21/28***
**U.S. Cl. 29—585** **31 Claims**



1. A method for making connections useful in the practice of electromigration comprising the steps of:

(a) providing a body of single crystal semiconductor material, said body having first and second major opposed surfaces, an outer peripheral edge area interconnecting said first and second opposed surfaces, a first preselected type conductivity, a first preselected resistivity, and a preferred crystallographic relationship between the plane of at least said first major surface and the crystallographic direction parallel to the perpendicularly measured distance between said major surfaces;

(b) forming a first layer of an insulating material on said first major surface;

(c) opening at least one window in said first layer of insulating material thereby exposing an area of said first major surface;

(d) establishing in said window in contact with said first major surface a deposit of the metal to be electromigrated; and

(e) applying a first layer of a conducting material over said first layer of insulating material and in contact with said deposit.

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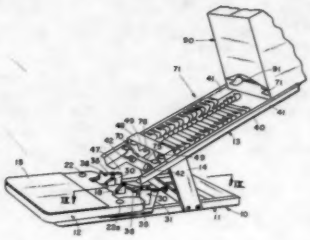
**4,381,599**

## MACHINE FOR ATTACHING HANGERS TO SLACKS

**Everett L. Duester, Zeeland, and Judd F. Garrison, Grand Rapids, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.**

**Filed Nov. 17, 1980, Ser. No. 207,348**
**Int. Cl.³ B23P *19/00***
**U.S. Cl. 29—717** **2 Claims**



1. A machine for securing hangers to garments, said hangers having an elongated bar-like body with a central supporting hook and terminating in a pair of garment gripping clamps one at each end, each clamp consisting of a pair of jaws hinged to each other and a U-shaped locking clip slidable over said jaws for holding them in closed garment gripping position, said machine having a stationary garment supporting platform, abutments on said platform for locating and holding a hanger with its jaws open to receive a garment; cantilevered arm means and a support element supporting said arm means for reciprocal movement between advanced and retracted positions; said arm means when moving to advanced position passing over said jaws to wipe them to closed position and pushing said locking clip into jaw locking position; fluid operated means for reciprocating said arm means; a magazine for hangers having a discharge end adjacent said abutments, a trigger at one side of said platform operatively connected to said fluid operated means for initiating its advance movement, said magazine having an elongated tray for receiving hangers telescoped over each other with the clips of each downstream hanger nested within the open jaws of the next upstream hanger, said tray being inclined downwardly toward said abutments at an angle inducing the hangers to slide downwardly thereof by gravity; said tray adjacent its discharge end having a pair of stops centered between the sides of the tray and spaced lengthwise thereof; the lower one of said stops being stationary and projecting above the surface of said tray; actuation means mounting the upper stop for reciprocal movement between an advanced position extending above the surface of the tray and restraining hangers against downward movement along said tray and a retracted position substantially flush with the surface of said tray, said upper stop when retracted being beneath the hanger seated against said lower stop, a sensing element responsive to the advance movement of said arm means, said upper stop when actuated by said sensing element advancing to kick the hanger bearing against said lower stop over said lower stop whereby it can advance to said platform; a guard positioned over said tray having a pair of fingers positioned over the hanger next upstream from the one positioned over said upper stop to hold the hanger against upward movement as the hanger on the upper stop is forcibly separated from it; means connected to said sensing element for maintaining said upper stop in extended position until said arm means is retracted to its initial position.

**4,381,600**

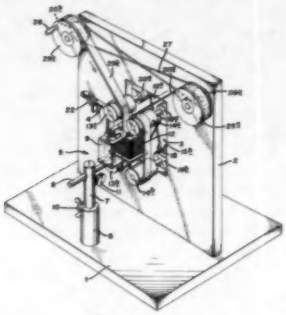
## MAGNETIC CORE WINDING APPARATUS

**Joseph A. Mas, Woodbury, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.**

**Continuation of Ser. No. 966,167, Dec. 4, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 237,048**

**Int. Cl.³ H01F *41/02***

**U.S. Cl. 29—738** **4 Claims**



1. An apparatus for winding a magnetic core from a strip of magnetically permeable metal around a prewound wire coil, comprising, in combination:

(a) a base;

(b) holding means mounted on said base for holding the prewound wire coil;

(c) driven winding means mounted on said base for engaging a loop of said strip of magnetically permeable metal which encircles the prewound wire coil through its center as the coil is being held by said holding means, and for revolving said loop around its axis normal to the plane in which the loop lies to form a wound core, with associated means for disengaging and withdrawing said winding means from said core; and

(d) retracting means associated with said base for withdrawing said strip from the formed wound core to reduce the circumference of the core while the core is held by the holding means and the winding means is disengaged and withdrawn from the wound core.

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**4,381,601**

## APPARATUS FOR MOUNTING ELECTRONIC COMPONENTS

**Kouichi Tamai, and Masao Tanaka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Division of Ser. No. 91,756, Nov. 6, 1979, abandoned. This application Jun. 24, 1981, Ser. No. 277,013**

**Claims priority, application Japan, Nov. 9, 1978, 53-138506; Nov. 9, 1978, 53-138508**

**Int. Cl.³ B23P *19/04***

**U.S. Cl. 29—740** **2 Claims**

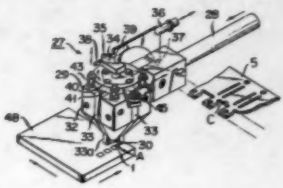
1. A mounting head for an electronic component, comprising:

a pillarlike block having a center hole and two pairs of grooves formed parallel to the length of said center hole in the peripheral wall surface of said block;

a contacting block having a bore which communicates with the center hole of said pillarlike block, the distal end of which has substantially the same external plane dimensions as those of the electronic component, and the proximal end of which is attached to the bottom of said pillarlike block;

two pairs of locating arms fitted in said grooves and capable of rocking around the substantially middle point thereof toward said center hole, the tip ends of said locating arms protruding beyond the distal end of said contacting block to form a semiconductor chip holding section capable of opening and closing as required;

a pickup means slidably fitted in the center hole and said



bore, and protruding from said contacting block to abut and attract the electronic component; and

a locating arm driving means for opening and closing the locating arms as required.

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**4,381,602**

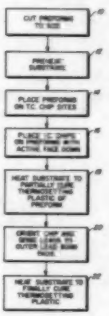
## METHOD OF MOUNTING AN I.C. CHIP ON A SUBSTRATE

**Chandler H. McIver, Tempe, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Dec. 29, 1980, Ser. No. 221,102**

**Int. Cl.³ H05K *3/34***

**U.S. Cl. 29—840** **10 Claims**



1. Method of mounting on a substrate an I.C. chip having flexible beam leads bonded to I/O terminals on the active face of the chip, said substrate having a metallized chip pad and outer leads pads on a surface of said substrate, comprising the steps of:

forming a preform made of a fiber glass web coated with a thermosetting plastic material to a size which substantially conforms to that of the chip pad;

preheating the substrate to a first temperature at which the thermosetting plastic of the preform becomes tacky;

placing the preform on the chip pad so that the preform adheres to the chip pad and pressing the chip with its active face down into the preform to initiate the process of encapsulating the active face of the I.C. chip and that portion of the leads proximate said chip in the plastic material of the preform;

partially curing the thermosetting plastic of the preform;

orienting the I.C. chip so that each of its leads substantially overlies an outer lead pad and bonding the outer lead bonding site of each lead to the outer lead pad it overlies; and

finally curing the thermosetting plastic material.

**4,381,603**

## DRY SHAVER

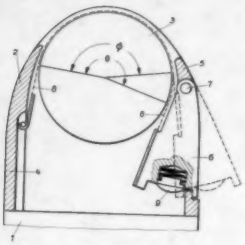
**Friedrich Schreiber, Frankfurt, and Horst Kirchner, Eschborn, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany**

**Filed Mar. 21, 1980, Ser. No. 132,593**

**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1979, 2913017**

**Int. Cl.³ B26B** *19/04*

**U.S. Cl. 30—43.92** **4 Claims**



1. A dry shaver comprising:
a shaver housing including a shearing foil holder;
a movable cutter having a longitudinal axis; and
a shearing foil which cooperates with said movable cutter, said shearing foil being clamped in a curved fashion on longitudinally extending side walls of said shearing foil holder, at least one of said side walls of said shearing foil holder being adapted to at least partially rotate about a swivel axis, the swivel axis extending in a direction substantially parallel to the longitudinal axis of said cutter, wherein said shearing foil, in an operating position, forms a wrap angle greater than 180° with respect to said cutter and, in a removed position, forms a wrap angle less than 180° with respect to said cutter.

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**4,381,604**

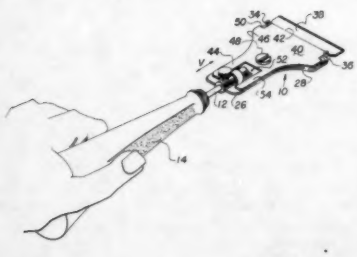
## VIBRATING SCRAPER

**Milton C. Horst, 1614 S. Lipscomb, Amarillo, Tex. 79102**

**Filed May 18, 1981, Ser. No. 264,972**

**Int. Cl.³ B26B** *3/00*

**U.S. Cl. 30—169** **4 Claims**



1. A holder for holding a razor blade adapted to be attached to a vibrating engraver comprising:
a. a cylindrical sleeve,
b. an bore in the sleeve,
c. a set screw radially in the sleeve,
d. a base plate having a front, back and two sides,
e. two loops on the back of the base plate circumferentially under the cylindrical sleeve,
f. one loop on the back of the base plate circumferentially over the cylindrical sleeve,
g. at least one of said loops fixed as by welding to the sleeve so that the base plate is permanently attached to the sleeve,
h. a lug on each side of the base plate extending upward therefrom, said lugs adapted to engage notches in a razor blade to be held in the front of the base plate,
i. a tapped hole through the base plate at about the center thereof,
j. a top jaw having a front, back, and two sides,
k. a hole through the top jaw at about the center thereof,
l. a holding screw through the hole in the top jaw and threaded into the tapped hole of the base plate to secure the top jaw to the base plate with the front of the top jaw over the front of the base plate,
m. a notch at the front corner of each side of the top jaw so that the top jaw mates with the base plate at this area,
n. a slot in the back of the top jaw forming
o. two prongs which straddle the sleeve, and
p. the jaws being curved with the center at the holding screw arched away from the base plate, so that
q. tightening the holding screw will press the prongs against the base plate and the front of the jaw against the front of the base plate.

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**4,381,605**

## SHEARING MACHINE HAVING ROTATABLE CUTTER WHEELS

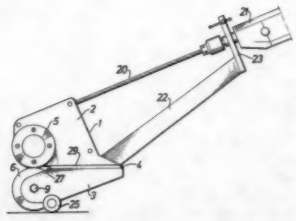
**Folke Holm, Hanogatan 7, S-150 13 Trosa, Sweden**

**Filed Mar. 12, 1981, Ser. No. 243,037**

**Claims priority, application Sweden, Nov. 19, 1979, 7909535**

**Int. Cl.³ B23D** *19/04*

**U.S. Cl. 30—240** **2 Claims**

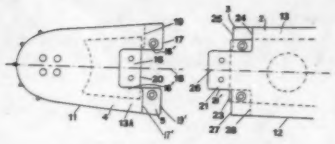


1. A shearing machine for cutting sheet metal of varying thickness comprising a supporting body having an upper and lower portion, at least one pair of rollers freely journalled on a shaft fixed to the lower portion of said body and a handle means for manually guiding said body about on said rollers, a freely rotatable cutter wheel having a planar edge mounted about a horizontal axis in the lower portion of said body, a driven cutting wheel having a serrated peripheral edge mounted in the upper portion of said body for rotation about an axis parallel to the axis of said freely rotatable cutting wheel, the peripheral edges of said cutting wheels being bevelled, said wheels being arranged offset axially with respect to each other so that the large side faces formed by said bevels are disposed in the same vertical plane and in tangential contact with each other to co-rotate, said body having means for removably mounting an electric hand motor for driving said driven cutting wheel.

## 4,381,606
## CHAIN SAW GUIDE BAR

Anders L. Ekrud, Sandviken, and Glenn G. E. Pantzar, Arsunda, both of Sweden, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Mar. 10, 1981, Ser. No. 242,309
Claims priority, application Sweden, Mar. 14, 1980, 8002016
Int. Cl.³ B27B 17/00
U.S. Cl. 30—387 11 Claims



1. Saw guide bar for chain saws comprising a main part and a nose part detachably fastened to the main part, said main part including slot-forming walls on opposite sides of a vertical center plane to form a first slot along its periphery for receiving a saw chain, said nose part including slot-forming walls on opposite sides of the vertical center plane to form a second slot along its periphery which is aligned with said first slot for receiving the saw chain, opposing edges of said slot-forming walls of said main part and said nose part forming joints, each joint on one side of said vertical center plane being displaced in the direction of chain travel relative to a laterally adjacent joint on the other side of said vertical center plane, said main part including at least one projecting part received in at least one recess in the nose part said projecting part having longitudinal edges disposed on opposite sides of a horizontal center plane and which engage corresponding longitudinal edges of said recess, said longitudinal edges of said recess being of integral, one-piece construction with a slot-forming wall of said nose part.

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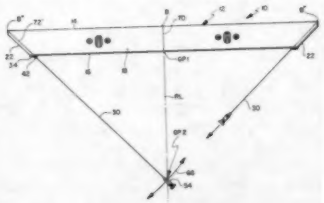
## 4,381,607
## CARPENTER'S TOOL

Christopher L. Place, 190 Woodhill Rd., Narragansett, R.I. 02882

Filed May 13, 1981, Ser. No. 263,105
Int. Cl.³ B43L 7/00
U.S. Cl. 33—1 G 10 Claims



1. A tool for conveniently marking a reference line on a working surface at a predetermined angular dispostion from an already established base line on said surface, said tool including an elongated member having generally parallel front and rear walls, said rear wall adapted for disposition along said established base line, a pair of angle lines each mounted on support means in turn attached to said member, said angle lines being extendable and retractable with respect to the front wall of said member at a pair of spaced locations therealong, a marking line associated with said member and extendable from said front wall thereof at a first guide point, and means associated with said angle lines to predetermine the respective lengths that said lines extend from said front wall thereof such that the intersection of said angle lines in front of said member defines a second guide point such that said marking line will define said predetermined angle with said member front wall when aligned along said first and second guide points.

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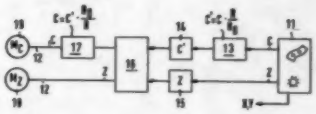
## 4,381,608
## METHOD FOR INTERPOLATING BETWEEN CARTESIAN AND ROTARY COORDINATES IN MACHINES

Harald Thormann, Neunkirchen; Horst Gose, Erlangen-Dechsendorf, and Arnold Weser, Augsburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 5, 1981, Ser. No. 290,228
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033202
Int. Cl.³ B43L 5/00
U.S. Cl. 33—1 M 2 Claims



1. A method for interpolating between Cartesian coordinate axes and an axis of rotation, and for controlling the axis of rotation of a numerically controlled machine, the numerically controlled machine being of the type having a control system for interpolating in Cartesian coordinates, the method comprising the steps of:

entering distances to be travelled along the axis of rotation at a predetermined radius into the control system, the axis of rotation being considered as a Cartesian coordinate axis;

entering into the control system an actual radius for interpolation and at least one distance to be travelled along a Cartesian coordinate axis; and

transforming coordinate data produced by the control system into values corresponding to the predetermined radius of the axis of rotation, so as to permit control of said axis of rotation.

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## 4,381,609
## LENGTH MEASURING INSTRUMENT

Siegbert Holstein, Stein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 107,272, Dec. 26, 1979, abandoned.
This application Apr. 19, 1982, Ser. No. 369,818
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1979, 2900113
Int. Cl.³ G01B 11/02
U.S. Cl. 33—125 C 8 Claims

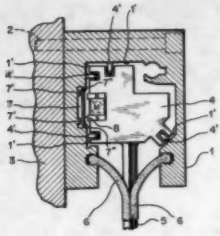
4. In a length measuring instrument including a flexible measuring scale, a scanning unit, and means for guiding the scanning unit along the scale, the improvement comprising:

the guiding means being independent of the scale;

means for defining a spacing member extending parallel to at least a portion of the scale, said spacing member positioned at a predetermined separation from the scanning unit; and

means, included in the scanning unit, for magnetically bias-

ing that portion of the scale adjacent the scanning unit into contact with the spacing member such that the separation



between the scale and the scanning unit adjacent the biasing means is maintained substantially constant.

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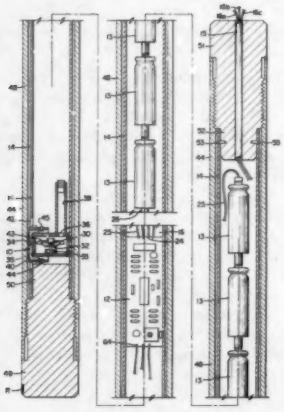
**4,381,610**

## SELF-CONTAINED DOWNHOLE COMPASS

**Melvin G. Kramer, Riverton, Wyo., assignor to The Brunton Company, Riverton, Wyo.**

**Filed Oct. 31, 1980, Ser. No. 202,738**
**Int. Cl.³ E21B *47/022***
**U.S. Cl. 33—312** **4 Claims**



**1.** In a downhole compass apparatus for orienting and sensing the direction of an instrument in a borehole wherein the instrument is extended from the earth's surface in a substantially vertical direction, the combination therewith comprising:

a hollow casing;

a compass unit mounted in said casing including a transducer board mounted in an opening formed in a wall of said casing, a transparent, fluid-filled vial mounted on said transducer board including expansion column means in direct communication with the interior of said vial to accommodate expansion and contraction of fluid within said vial, and a movable magnetic field-responsive portion in said vial provided with a transparent area extending in a predetermined direction with respect to magnetic North;

light-emitting means on said transducer board alignable with said transparent area for transmitting a light beam therethrough;

light-sensing means mounted on said transducer board being aligned with said light-emitting means to sense said light beam when said light-emitting means is aligned with said transparent area, said light-sensing means and light-emitting means vertically aligned on opposite sides of said magnetic field-responsive portion, and said transparent area extending in a radial direction to intercept the path of light betweeen said light-emitting means and light-sensing means;

signal generating means in said casing and associated with said light-sensing means and light-emitting means to generate a control signal in response to the light beam sensed by said light-sensing means and to transmit same to the earth's surface; and

a signal detector at the earth's surface including transmission wires extending between said signal detector and said signal-generating means, said signal detector having an on-off switch connected to said transmission wires, said signal-generating means operative to transmit signals through said transmission wires to said power source in response to closure of said on-off switch.

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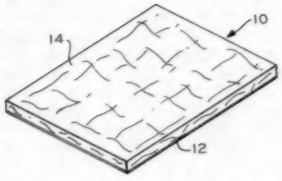
**4,381,611**

## METHOD AND APPARATUS FOR ABSORBING MOISTURE

**Marvin Wishman, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 844,350, Oct. 21, 1977, abandoned. This application May 4, 1981, Ser. No. 260,472**
**Int. Cl.³ F26B *5/16***
**U.S. Cl. 34—9** **11 Claims**




**1.** A method of transferring liquid from a liquid-bearing surface, comprising:

positioning a nonwoven fabric comprising a plurality of staple polypropylene fibers including a plurality of unfused polypropylene fibers on a first side thereof and a second plurality of fused polypropylene fibers on a second opposite side thereof with at least a portion of the unfused fibers of the first side in contact with the liquid on the liquid-bearing surface; and

allowing the liquid from the liquid-bearing surface to migrate through the unfused fibers to the fused fibers on the second side of the nonwoven fabric.

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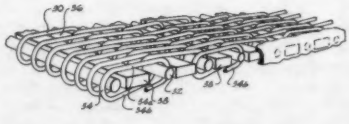
**4,381,612**

## DRYER FABRIC FOR PAPERMAKING MACHINE AND METHOD

**Samuel E. Shank, Greenville, S.C., assignor to Wangner Systems, Inc., Greenville, S.C.**

**Filed Jun. 3, 1981, Ser. No. 269,838**
**Int. Cl.³ F26B *13/08***
**U.S. Cl. 34—116** **24 Claims**



**1.** In apparatus for drying a web of paper material in a dryer section of a papermaking machine which includes a plurality of

heated cylinders over which the web travels for drying, an endless traveling dryer belt carried about rollers and adjacent said cylinders contacting said web to hold said web against said heated cylinders for drying, air defined in a space between said cylinder and dryer fabric being forced through said web and dryer belt drying said paper web, said dryer belt being open to the passage of air therethrough, the combination of a non-woven fabric belt which includes a plurality of elongated helix means extending in a cross-wise direction constructed from a polymeric material having a degree of plasticity for accommodating stress during repeated travel over said rollers at elevated drying temperatures, said helix means including flattened loops having generally parallel upper and lower runs of said material presenting a smooth generally flat web contacting surface, joint means joining adjacent ones of said helix means successively together in a machine direction to provide an endless dryer belt of desired dimension; an open fabric mesh defined between said joint means and runs of said loops; polymeric filler means capable of withstanding said drying temperatures inserted between said runs in each said helix loop across the entire width of said fabric in said cross-wise direction to close said fabric mesh and control the flow of air through said dryer belt and reduce fluttering of said web of paper thereagainst during drying and a heated sealed seam along edges of said fabric sealing said filler means and fabric providing integral fabric structure.

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**4,381,613**

## SKI BOOT

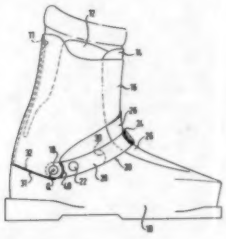
**Josef Lederer, Post St. 9, D-8069 Jetzendorf, Fed. Rep. of Germany**

**Filed Dec. 31, 1980, Ser. No. 221,633**

**Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001633**

**Int. Cl.³ A43B 5/04**

**U.S. Cl. 36—121** **22 Claims**



**1.** Ski shoe comprising a forward heel cup and an ankle cuff pivotally mounted on said forward heel cup around a transverse axis (Q) situated in front of the Achilles heel tendon line of the shoe and extending transversely of the longitudinal direction of shoe and defined by sidewardly extending hinge points, support devices for holding said ankle cuff on said boot in a downhill skiing position, in which position said ankle cuff forces the lower leg into a forwardly-inclined downhill skiing position, characterized in that said hinge points **(18)** and the transverse axis (Q) are adjustably arranged, guide bearings **(22)** secured to said forward heel cup **(10)** and spaced from said transverse axis (Q), a guide **(28)** pivotally mounted on each said guide bearing **(22)**, each said hinge point **(18)** secured to one of said guides **(28)**, said hinge points **(18)** defining the transverse axis (Q) being shiftable out of the downhill skiing position (FIG. 1) into a resting position (FIG. 2), by shifting said guides **(28)** above said guide bearings **(22)** with said support devices **(32, 31)** being shifted in such a way that the lower leg supported by said ankle cuff **16** is movable from said downhill skiing position into a resting position.

**4,381,614**

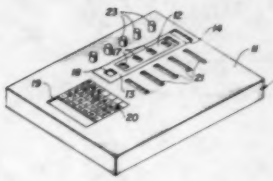
## CALENDAR

**Taib Kebe, Banque Centrale des Etats, de l'Afrique de l'Ouest, B. P. 3159, Dakar, Senegal**

**Filed Apr. 6, 1982, Ser. No. 365,914**

**Int. Cl.³ G09D 3/10**

**U.S. Cl. 40—118** **8 Claims**



**1.** A calendar comprising a supporting body portion having date display areas, a single weekday movable display element on the body portion bearing spaced weekday indicia adapted to move adjacent to one display area of the body portion, plural month and year date display elements on the body portion adapted to be separately and independently moved one at a time adjacent to other display areas of the body portion and having portions thereof extending closely adjacent to said single weekday movable display element, said single and plural display elements having cooperating driving components, and driving means engageable with the cooperative components of the single display element and one of said plural display elements to drive them in unison while the others of said plural display elements remain fixed relative to said supporting body portion.

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**4,381,615**

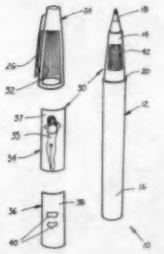
## INEXPENSIVE WRITING INSTRUMENT WITH ILLUSION PRODUCING MEANS

**Victor Lonsmin, 1406 Ogden, LaGrange, Ill. 60525**

**Filed Nov. 9, 1981, Ser. No. 319,478**

**Int. Cl.³ G09F 3/00, 7/00; A63J 3/00; G02B 27/02**

**U.S. Cl. 40—334** **10 Claims**



**1.** In a writing instrument having a body member carrying a writing mechanism, a cap member removably fitting on said body member to cover said writing mechanism, the improvement comprising means on said cap and body members to create an illusion including an opening in said cap member, a film having an image being mounted on said cap member in said opening, said body member being of one color and having a different color area thereon, said different color area being selectively locatable behind said film by manually moving said cap member relative to said body member, when said different color area of said body member is away from said film all features of said image on said film are all visible, when said different color area is behind said film at least some of said

features of said image on said film appear invisible, whereby said features on said film can be selectively backed or not backed by said different color area so that at least some of the features may be made to appear and disappear by manually moving said cap member relative to said body member.

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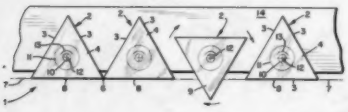
**4,381,616**

## INTERNALLY ILLUMINATED ROTATABLE PICTORIAL MENU DISPLAY

Norman K. Saxer, 5700 Broadmoor, Mission, Kans. 66202

Filed Sep. 11, 1981, Ser. No. 301,386
Int. Cl.³ G09F *13/00*
U.S. Cl. 40—502 10 Claims



1. An internally illuminated changeable exhibitor apparatus, comprising:

a plurality of independent exhibitor units, each of said units having a plurality of display panels forming a housing, one of said display panels in an exhibiting orientation providing an exhibiting panel, the plurality of said exhibiting panels being edge to edge forming an exhibiting surface, said exhibiting panels having overlapping opaque flange means connected to the adjacent edges of said exhibiting panels for blocking stray light from being transmitted from the rear of said exhibiting surface between said independent exhibitor units;

a light source within each exhibitor unit for internally illuminating said exhibiting panels; and

means for rotating each exhibitor unit for selecting a display panel to be an exhibiting panel in said exhibiting surface.

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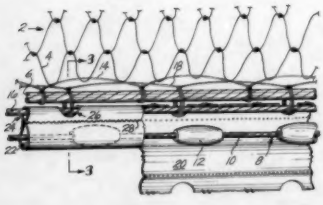
**4,381,617**

## FISH NET WITH REDUCED BOTTOM FRICTION

Edward S. McSweeny, Jr., Homestead, Fla., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 29, 1980, Ser. No. 220,943
Int. Cl.³ A01K *73/02*
U.S. Cl. 43—9 8 Claims



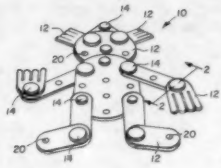
1. In a bottom contacting fish net, the improvement which comprises: flexible tubular bearing means enclosing at least the leadline of the net, the internal diameter of the tubular bearing means being substantially larger than the maximum diameter of the leadline so as to create an open space therebetween, said means having openings permitting free ingress and egress of water into the open space, said openings also providing tying access for joining the leadline to the net, said bearing means serving to reduce frictional forces between the leadline and the bottom substrate.

**4,381,618**

## TOY FLAT ARTICLE CONSTRUCTION SET

Elisabeth Krisel, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 19, 1981, Ser. No. 226,065
Int. Cl.³ A63H *33/12*
U.S. Cl. 46—22 4 Claims



1. A toy flat article construction set for making fanciful creations comprising:

a plurality of flat, flexible and stretchable articles of different peripheral shapes, each article comprising an upper and a lower stretchable fabric layer secured to opposite surfaces of an intermediate layer of resilient foam material and having one or more openings extending therethrough; and

at least one double-headed button, the heads of said button and the openings being sized such that each head is larger than each opening, at least one of the heads being insertable through each opening by stretching the periphery of the opening, whereby said button is insertable through openings in two or more of said articles for releasably securing said articles together to form a fanciful creation.

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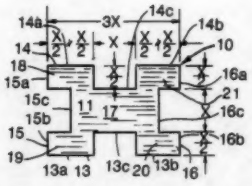
**4,381,619**

## BUILDING BLOCK

David J. Griffin, 530 Main St., Cold Spring, Minn. 56320

Filed Aug. 4, 1980, Ser. No. 175,012
Int. Cl.³ A63H *33/08*
U.S. Cl. 46—25 8 Claims



1. A set of interfitting toy building blocks, with each block having rectangular dimensions of 3x by 2x by x and comprising,

a substantially rectangular-shaped main body portion having dimensions of 2x by x by x

four spaced corner portions, with each of said corner portions projecting outwardly from a respective corner of said main body portion,

four indentations, with each of said indentations disposed between a respective pair of said corner portions, and

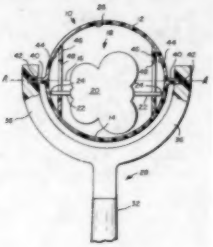
wherein each of said corner portions is complementary in size and shape to each of said indentations.

4,381,620

## ACTION DEVICE WITH CONFINED ACTION ELEMENT

James S. Panzarella, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Nov. 27, 1981, Ser. No. 325,353
Int. Cl.³ A63H 1/32
U.S. Cl. 46—47 7 Claims



1. A rotatable hollow ball action device comprising:
a hollow transparent ball having an inner peripheral surface;
an action element having a spindle of a length slightly less than the diameter of said inner peripheral surface, said spindle having end portions thereof bearing upon and in rolling engagement with diametrically opposed predetermined portions only of said inner peripheral surface; and
means on said inner peripheral surface for confining movement of each of said spindle end portions to said predetermined portions whereby primarily spinning and limited rocking motion is imparted to said action element upon rotation of said ball.

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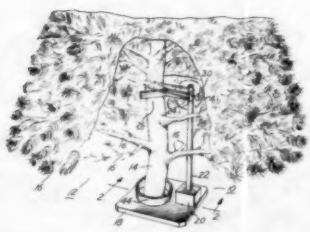
4,381,621

## TREE STAND

Harry S. Eby, Bristol, Ind., assignor to Eby's Pines, Inc., Bristol, Ind.

Filed Aug. 20, 1981, Ser. No. 294,710
Int. Cl.³ A01G 9/12
U.S. Cl. 47—40.5 4 Claims



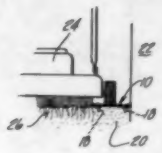
1. A tree stand comprising a base member for supporting the stand and a tree attached thereto and having a water container for receiving the end of the trunk of the tree, a vertical member extending upwardly from said base member near the trunk of the tree, trunk engaging means extending outwardly from said vertical member including a member on said engaging means for receiving the trunk of the tree and preventing lateral movement of the trunk, and securing means for pulling the trunk into said receiving member, said securing means including an elastic band fixed on one end to said engaging member and having a hook on the other end for connecting to the vertical member after the band has been passed around the tree trunk.

4,381,622

## LAWN EDGE CONSTRUCTION AND METHOD

Vernon B. Spidell, Oak Park, Mich., assignor to Alan L. Kaufman, Southfield, Mich.

Filed Dec. 29, 1980, Ser. No. 220,786
Int. Cl.³ A01G 9/00
U.S. Cl. 47—33 19 Claims



1. In combination with a lawn on an earth surface and an area adjacent said lawn forming an edge of said lawn, a lawn edge construction comprising:
an artificial turf structure constructed of synthetic turf and having a turf edge extending along said edge of said lawn, the synthetic turf of said turf structure comprising a grass-like portion and a base portion;
anchor means for anchoring said turf structure to the earth surface.
cover means constructed of synthetic turf having a grass-like portion and a base portion for hiding said anchor means from view; and
securing means for securing said cover means to said anchor means,
wherein said turf includes a plurality of recesses within which said anchor means is adapted to be disposed which recesses are covered from view by said anchor means and said cover means.

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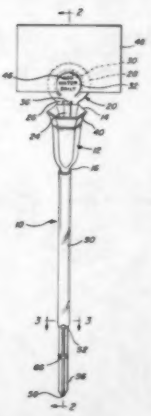
4,381,623

## ADD-WATER FUNNEL AND CARD HOLDER

Arnold A. Koistinen, Watertown, S. Dak., assignor to Dakota Plastics Company, Watertown, S. Dak.

Filed Dec. 28, 1981, Ser. No. 335,325
Int. Cl.³ A01G 29/00
U.S. Cl. 47—48.5 9 Claims



1. A water funnel arrangement for cut flowers including a structure for funnelling water onto a surface of a body of foam material for receiving cut ends of cut flowers, the arrangement comprising a funnel, the funnel having a large opening for

receiving water and a small opening for passing water therefrom, a tubular member having an opening at its upper end connected with the small opening of the funnel and for passing water through the tubular member and for exit of the water at the lower end onto a body of foam material, an elongated longitudinal fin equipped insertion means being received into the lower end of the tubular member for allowing the passage of water and for insertion into said body of foam material, the insertion means having barrier means intermediate its length for limiting the depth of insertion of the insertion means by engaging the surface of the foam material and for varying the flow of water from the lower end of the tubular member by varying, slightly, the spacing of said barrier means from the lower end of the tubular member.

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**4,381,624**

**HIGH PURITY HYBRID CABBAGE SEED PRODUCTION**

**Robert H. Lawrence, Jr., Tarrytown, N.Y., and Phillip E. Hill, Hollister, Calif., assignors to Agrigenetics Research Associates Limited, Denver, Colo.**

**Filed Jul. 17, 1980, Ser. No. 169,875**

**Int. Cl.³ A01G *1/00***

**U.S. Cl. 47—58** **2 Claims**

1. A process for the production of high purity hybrid cabbage seed, comprising:

(a) selecting a maximally self-incompatible parent plant;

(b) cloning said selected maximally self-incompatible parent plant by axillary bud propagation to produce a first cloned parental line that is both maximally self-incompatible and maximally sib-incompatible;

(c) crossing plants of said first cloned parental line with plants of a second parental line; and

(d) collecting high purity hybrid seed from said first cloned parental line,

wherein said axillary bud propagation is effected by establishing shoots from an excised axillary bud from said selected maximally self-incompatible parent plant, multiplying said shoots by axillary buds excised from said shoots, and rooting axillary buds excised from said multiplied shoots.

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**4,381,625**

**DOOR LOCKING DEVICE**

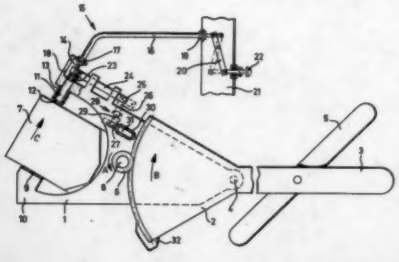
**Marcel Andrei-Alexandru, Bietigheim-Bissingen; Klaus Ott, Heilbronn, and Hans Prohaska, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 103,535, Dec. 14, 1979, abandoned. This application Mar. 15, 1982, Ser. No. 358,301**

**Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854713**

**Int. Cl.³ E05F *15/00***

**U.S. Cl. 49—280** **1 Claim**



1. A combination power window and power door locking device for use in an automotive vehicle door comprising, in combination:

an electric motor;

means for mounting said motor internally of said door;

first means for coupling said motor to a movable window pane holder within said door to move said holder between first and second end positions;

second means for coupling said motor to a movable extension of a door locking mechanism within said door which is activated to lock and unlock said door;

means for selectively applying external power to said motor;

means cooperating with said first and second means and responsive to the position of said holder for engaging and activating said door locking mechanism when said holder is in one of its end positions; and,

wherein said motor is rotatably mounted in said door and resiliently urged toward an angular stop position until said holder is in said one of its end positions whereupon continued application of said external power to said motor rotates said motor away from said stop position to activate said door locking mechanism.

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**4,381,626**

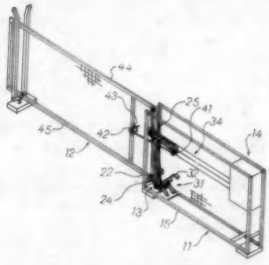
**AUTOMATIC GATE ASSEMBLY**

**Thomas M. Courtis, and Carl E. Donelson, both of Red Lodge, Mont., assignors to Red Lodge Manufacturing Co., Red Lodge, Mont.**

**Continuation-in-part of Ser. No. 82,543, Oct. 9, 1979, Pat. No. 4,270,312. This application Feb. 24, 1981, Ser. No. 237,713**

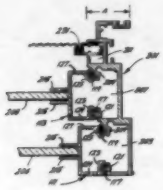
**Int. Cl.³ E05D *7/00***

**U.S. Cl. 49—385** **12 Claims**



1. A gate assembly including support means, gate means carried by said support means and movable with respect thereto, gate control means and gate activating means associated with said gate means, said support means including a plurality of frame members, said gate means having one end thereof disposed adjacent to said support means and extending outwardly therefrom, pivot means connecting a lower part of said gate means to an adjacent lower portion of said support means, said pivot means including a rotatable shaft and shaft carrier means, said gate control means including biasing means associated with said gate means, said gate activating means including a power source mounted on said support means, drive means operatively connected to said power source, said drive means including translating means activatable by said power source, said translating means being disposed for movement in a substantially horizontal plane, an arm member having one end pivotally connected to said translating means, said arm member having its opposite end pivotally connected to said gate means, said connection between said arm member and said gate means being at a point on said gate means adjacent said support means and centrally located between said upper and lower edges of said gate means, whereby said gate means is movable about said pivot means in a vertical plane by said gate activating means.

4,381,627
NARROW PROFILE JAMB WINDOW
Walter E. Cichonski, Philadelphia, Pa., assignor to Stephen Laurie Manufacturing Company, Inc., Bristol, Pa.
Filed Nov. 10, 1980, Ser. No. 205,149
Int. Cl.³ E05D 15/06
U.S. Cl. 49—453 10 Claims



1. A window assembly comprising:
means securable to a building for holding a plurality of movable window panes mounted in frames;
a first window pane surrounded by a frame part thereof held by said holding means and slidable therein;
a first and second mating surfaces on said holding means for mating with the frame part of a said pane and forming the track against which said frame part slides;
a first and second sealing means on said frame part of said pane for sealing against each of said holding means formed track mating surfaces, said second sealing means being positioned in a plane rotated less than 90 degrees from the plane in which said first sealing means is positioned.

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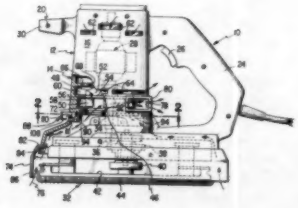
4,381,628
DUST CONTROL SYSTEM FOR SURFACE TREATING MACHINE
William C. Dicke, Easley, S.C., assignor to The Singer Company, Stamford, Conn.
Filed Jul. 20, 1981, Ser. No. 284,844
Int. Cl.³ B24B 55/06, 23/00
U.S. Cl. 51—170 TL 5 Claims



1. In an electrically driven portable surface treating machine such as a sander, polisher, buffer, and the like, having an oscillatable platen driven from a motor shaft and which creates dust during use, a dust collection fan on the motor shaft in a fan housing portion of the tool housing, and an exhaust outlet or port which can selectively be fitted with dust collection means, such as a filter bag the improvement comprising a selective shutter arrangement between said platen and said fan which may be selectively opened and closed by the machine operator to enable the machine to be selectively operated in either a "dustless" or a "non-dustless" mode of operation.

4,381,629
GREENHOUSE
Min H. Ahn, 5111, Maple Rd., Richmond, British Columbia, Canada
Filed Nov. 28, 1980, Ser. No. 210,949
Int. Cl.³ E04B 1/343, 1/347
U.S. Cl. 52—66 6 Claims

1. A greenhouse comprising a plurality of tubular frames each frame comprising a plurality of tubular members joined to each other by joining members to form walls defining a first area and to form a roof covering a portion of said first area;
spaced apart layers of plastic sheet extending over the frames to act as a means of preserving heat within the greenhouse;
track means interposed between the roof and the walls whereby the roof may be moved along the track to cover a preselected part of the first area;
channel members running along the top and bottom of the walls, said channel members facing outwardly;
a filler to fit loosely into each channels and to receive the ends of the plastic sheets, wrapped around each filler;
locking means to maintain each filler, with the plastic sheets wrapped around it, in place within the channel member.

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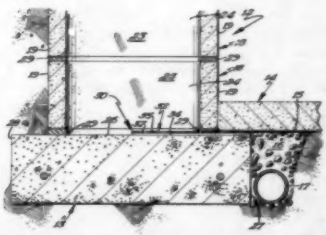
4,381,630
FOUNDATION VENT STRUCTURE
John H. Koester, 1410 Colorado Ave. South, Minneapolis, Minn. 55416
Filed Dec. 1, 1980, Ser. No. 212,018
Int. Cl.³ E02D 27/00
U.S. Cl. 52—169.5 2 Claims



1. A foundation vent structure for use in providing a moisture vent joint between each vertical wall and the footing of a basement, and below the basement floor, the vertical walls of the basement being formed of hollow concrete blocks having an interconnecting web between the sides thereof to define vertically oriented openings therein, drain tile being positioned below the marginal portions of the basement floor, said vent structure being formed of a flexible, impervious plastic material and being of elongate generally rectangular shaped configuration having substantially straight, parallel longitudinal edges, said vent structure being shaped throughout its length to define alternate tunnels and channels, said tunnels and channels extending transversely from one longitudinal edge to the other longitudinal edge of the vent structure, each tunnel and each channel including substantially, parallel vertical sides integral with and interconnected by a web, each vertical side being common to an adjacent tunnel and channel, the webs of

the tunnels and channels being perforated to permit moisture to pass through the perforations, said vent structure being adapted to be positioned upon the footing of a basement wall along substantially the length of the footing and below the lowermost row of concrete blocks, said vent structure having a width dimension of sufficient magnitude to extend beyond the inner edge of the footing below the basement floor and to the central portion of the concrete blocks to intercommunicate the opening in the concrete blocks with the perforations in the webs of the tunnels and channels to permit water and moisture to be vented below the basement into the drain tile thereof.

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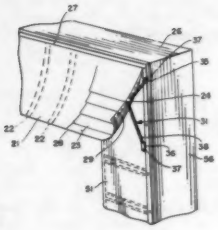
**4,381,631**

## LOADING DOCK SHELTERS

**Sylvan J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa**

**Filed Apr. 29, 1981, Ser. No. 258,564**
**Int. Cl.³ E04H *14/00***
**U.S. Cl. 52—173 DS** **11 Claims**



1. A loading dock shelter for use around a doorway in a wall, comprising:

a. a flexible head cover panel, extending the width of said doorway, said head panel having top, bottom and side edges;

b. support means for supporting said head panel along its top edge to extend across the upper portion of said doorway to sealably engage with the top of a truck body;

c. at least one retaining means affixed about one of said side edges of said head panel in an intermediate position between the bottom and top edges of said head panel;

d. at least one flexible elastic restraining means having an intermediate portion and end portions, said intermediate portion slidably received within said retaining means and said end portions in a fixed position secured relative to said wall, said retaining means allowing said restraining means to stretch along its length pulling additional portions of said restraining means through said retaining means;

e. said restraining means cushioning the movement of said head panel maintaining operable alignment of the head panel.

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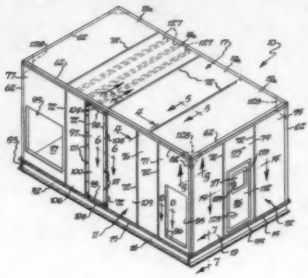
**4,381,632**

## SNAP-LOCK HOUSING CONSTRUCTION AND PARTS THEREOF

**Lawrence J. Geitner, Angola, N.Y., assignor to Buffalo Forge Company, Buffalo, N.Y.**

**Filed Jul. 9, 1980, Ser. No. 167,209**
**Int. Cl.³ E04B *1/38***
**U.S. Cl. 52—262** **17 Claims**

1. A housing structure comprising a plurality of panels having first snap-locking means on a plurality of sides thereof for locking engagement with adjacent members, base means having second snap-locking means for receiving first snap-locking means on first sides of said panels in locking engagement, a roof having third snap-locking means for receiving first snap-locking means on second sides of said panels in locking engagement, fourth snap-locking means for coacting with first snap-locking means on third and fourth sides of said panels for locking said panels in side-by-side relationship to form sides of said housing structure, said roof comprising a plurality of



second panels having fifth snap-locking means on a plurality of sides thereof, and sixth snap-locking means for coacting with said fifth snap-locking means for locking said second panels in side-by-side relationship.

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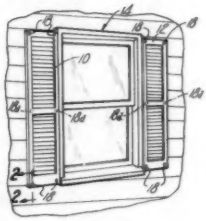
**4,381,633**

## MOUNTING ORNAMENTAL WINDOW SHUTTERS

**Richard J. MacLeod, Milford, Mich., assignor to Tapco Products Company, Inc., Detroit, Mich.**

**Continuation-in-part of Ser. No. 52,672, Jun. 27, 1979, abandoned. This application Sep. 17, 1980, Ser. No. 187,962**
**Int. Cl.³ E06B *7/08*; F16B *19/00***
**U.S. Cl. 52—473** **13 Claims**



1. In building trim construction, the combination comprising a decorative non-functional window shutter of ornamental lightweight construction such as aluminum or plastic and having a plurality of mounting openings, and a one-piece fastener of non-corrosive plastic construction adapted to be received by interference press fit in a preformed hole in a building wall for rigidly mounting said shutter,

said fastener comprising a body,

said body including a head portion, a first portion extending from said head, a second portion extending from said first portion and a free end portion,

said second portion being formed with longitudinally spaced pairs of diametrically opposed teeth separated by slots and extending radially outwardly from a base and axially toward said head portion,

the circumferential extent of each tooth being greater than ninety degrees,

each said tooth being of generally uniform thickness and extending toward said head portion at an acute angle,

adjacent teeth being connected to one another at said base by a curved portion,

the length and axial spacing of said teeth being such that each tooth can flex radially inwardly independently of the

adjacent tooth as the fastener is forced through the openings and will flex back to its original position after passing through the opening in the shutter without deforming the opening and will thereafter yieldingly engage the sides of said opening in the building without deforming said opening,

each said tooth comprising an outer surface and an inner surface,

said outer surface of each said tooth lying in a conical plane and said inner surface of each said tooth lying in a conical plane,

the outer surface of one tooth being joined to the inner surface of the adjacent tooth,

said conical plane of said outer surface forming a greater angle with a radial plane than the angle of said conical plane of said inner surface forms with a radial plane,

each said tooth having an axial peripheral surface,

each said tooth having a radial surface extending inwardly from said axial surface to said inner surface.

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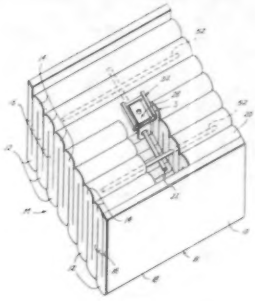
**4,381,634**

## FIBER BLANKET INSULATION MODULE

**Mack A. Hounsel, and Carlisle O. Byrd, Jr., both of Houston, Tex., assignors to Manville Service Corporation, Denver, Colo.**

**Filed Mar. 20, 1981, Ser. No. 245,946**
**Int. Cl.³ E04B *1/80***
**U.S. Cl. 52—506** **12 Claims**



1. A refractory ceramic fiber blanket module for insulating an inner surface, such as a wall, of a furnace or the like, comprising:

(a) an insulating blanket folded into a plurality of folds of adjacent layers of refractory ceramic fiber insulating material, said blanket comprising:

(1) an inner surface portion exposed along an insulation surface to the interior of the furnace;

(2) an outer surface portion adapted to be mounted against a wall of the furnace; and

(3) side portions formed from said layers and being folded adjacent said inner and outer surface portions to form alternating inner and outer folds; and

(b) means for supporting said blanket on the inner surface of the furnace, comprising:

(1) support means extending through a plurality of said side portions of said blanket adjacent said outer folds to support said blanket in place;

(2) suspension means mounted on said outer surface portion of said blanket extending between a plurality of adjacent layers forming an inner fold therebetween for receiving said support means; and

(3) means for attaching said suspension means to the inner surface of the furnace.

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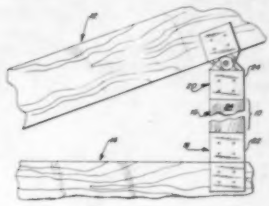
**4,381,635**

## INSTANT TRUSS ROOF SUPPORT SYSTEM

**Charles P. Solo, 27 W. 336 Mardon Rd., West Chicago, Ill. 60185**

**Filed Sep. 29, 1980, Ser. No. 191,851**
**Int. Cl.³ E04C *5/18, 3/17***
**U.S. Cl. 52—639** **11 Claims**



1. An add-on roof reinforcing brace for use between an existing elongated roof rafter and its associate elongated ceiling joist, wherein the existing roof rafter angles upwardly relative to a generally horizontally disposed joist, and with said rafter and associate joist being located in substantially the same vertical plane; said add-on roof reinforcing brace comprising, in combination:

an elongated bracing stud of rectangular cross-section and of a length to span the greater portion of the vertical distance between portions of the existing rafter and joist to which the brace is to be attached;

a first attachment means adapted and arranged for securement to one end of the bracing stud;

a second attachment means adapted and arranged for securement to the second end of the bracing stud;

each said attachment means including a first attachment section having portions thereof formed and positioned to cooperate with and secure to at least some of the multiple sides of the bracing stud adjacent the end of the bracing stud, and a second attachment section having portions thereof formed and positioned to cooperate with and secure to at least one longitudinal surface portion of the existing rafter or joist located at a region spaced intermediate the ends of said rafter or joist, and without having to separate any portion of the existing assemblage of rafter and joist;

and at least one of said first and second attachment means providing a pivot means between the first and second attachment sections thereof,

whereby said pivoted second attachment section may be selectively angled relative to the longitudinal axis of the stud to which the first attachment section connects to permit attachment portions of said pivotable second attachment section to be moved into an adjacent relationship with at least one longitudinal side of the existing structure to which said pivoted second attachment section is to be secured.

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**4,381,636**

## FRAMEWORK STRUCTURE

**Dennis H. Sapp, Terre Haute, Ind., assignor to Research-Cottrell, Inc., Chicago, Ill.**

**Filed Dec. 8, 1980, Ser. No. 214,019**
**Int. Cl.³ E04B *5/14***
**U.S. Cl. 52—648** **15 Claims**

1. A structure comprising:

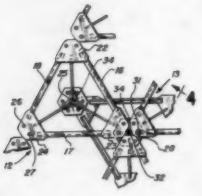
a first plurality of tetrahedral elements each defining a base and an apex and formed of edge elements and corner connectors one each at each corner of the element base;

first securing means for removably securing the corner connectors of the bases of said elements in a first array with said bases thereof defining a first common plane and the apices thereof projecting perpendicularly thereto to

define a plurality of of tetrahedral projections narrowing away from said plane and a plurality of complementary first spaces therebetween widening away from said plane;

a second plurality of tetrahedral elements each defining a base and an apex and formed of edge elements and corner connectors;

second securing means for removably securing the elements of said second plurality in a second array with the bases thereof defining a second common plane and the apices thereof projecting perpendicularly to said second common plane to define a plurality of tetrahedral projections narrowing away from said second common plane and a plurality of complementary second spaces therebetween widening away from said second common plane, said



second array being nested with said first array with the projections of said first array received in said spaces of the second array and the projections of said second array received in said spaces of the first array with the planes of the bases of said second array being substantially parallel to the plane of the bases of said first array; and

third securing means for removably securing the connectors at the apices of the first array to the connectors of the bases of the second array, and the connectors at the basis of the first array to the connectors at the apices of the second array, the corner connectors at the apex of the elements being secured by said third securing means to corner connectors at a corner of the base of each of three elements nested therewith.

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**4,381,637**

## DEVICE FOR CORRECTLY POSITIONING THE FILM RELATIVE TO THE ARTICLES TO BE WRAPPED IN A PACKAGING MACHINE

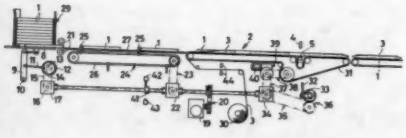
**Aris Ballestrazzi, and Lamberto Tassi, both of Vignola, Italy, assignors to SITMA - Societa Italiana Macchine Automatiche S.p.A., Spilamberto, Italy**

**Filed Apr. 15, 1980, Ser. No. 140,597**

**Claims priority, application Italy, Apr. 24, 1979, 22145 A/79**

**Int. Cl.³ B65B *57/04, 57/12***

**U.S. Cl. 53—51** **3 Claims**



1. A device for correctly positioning film web relative to articles to be wrapped thereby in a packaging machine which employs a printed film web whereon the articles are sequentially fed to be subsequently wrapped in wrappers by means for folding down the film web and for welding and cutting sequential sections of said film web, said device comprising: first means for detecting the position of the articles prior to their engagement by the printed film web; second means for detecting the position of the printed symbols reported on sequential film web sections prior to the engagement of said section with the respective articles to be wrapped; means for comparison of the indication of said first and second detecting means, said comparison means including a first logical gate for detecting coincident indications coming from said first and said second detection means, a second logical gate for detecting advanced indications from said second detecting means relative to those coming from said first detecting means and a monostable multivibrator responsive to every indication from said first detection means but which can be disabled by said first logical gate whenever coincident indications are detected coming from both said first and said second detection means; and actuating means controlled by said comparison means to vary the feeding speed of the film web relative to the speed at which said articles are forwarded in the case in which the indications of said first detecting means do not coincide with those of said second detecting means, said actuating means including a variable output speed differential inserted in the film web feeding system, and said second logical gate and said stable multivibrator being associated with said actuating means so as to command the decrease and increase, respectively, of the film web speed.

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**4,381,638**

## APPARATUS WITH A BOBBIN SUPPORT MEMBER

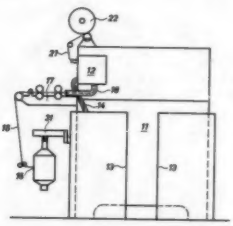
**Per O. Olsson, Genevad, Sweden, assignor to Rieter Machine Works Limited, Winterthur, Switzerland**

**Filed Sep. 8, 1980, Ser. No. 185,015**

**Claims priority, application Switzerland, Sep. 28, 1979, 8786/79**

**Int. Cl.³ D01H *1/12***

**U.S. Cl. 57—90** **6 Claims**



1. An apparatus for use with an open-end spinning machine for producing a fancy yarn, comprising:

a fibre sliver can containing fibre sliver deposited therein;

a bobbin support member detachably mountable upon said fibre sliver can;

said bobbin support member being provided with means for detachably mounting said bobbin support member on said can; and

at least one support element for supporting a roving bobbin provided for said bobbin support member.

4. The apparatus as defined in claim 1, wherein:

said bobbin support member comprises a vertically arranged rod;

a hook defining said means for detachably mounting said bobbin support member on said can provided at an upper end of said vertically arranged rod;

said hook being capable of being secured to an upper rim of the related can where said bobbin support member is detachably mounted;

said vertically arranged rod being provided with a handle;

said vertically arranged rod having a lower end;

a can contacting member provided at said lower end of said vertically arranged rod and which is capable of being brought into contact with the can.

4,381,639

## SHEATH-CORE YARN FOR SEVERE THERMAL PROTECTING FABRICS AND METHOD THEREFOR

Robert R. Kress, Hatboro, Pa., assignor to Record Industrial Company, King of Prussia, Pa.

Filed Jun. 19, 1980, Ser. No. 160,956
Int. Cl.³ D02G 3/18, 3/36, 3/44
U.S. Cl. 57—229 4 Claims

1. A yarn comprising a sheath spun from a roving of aramid fibers surrounding a continuous filament core of an amorphous silica product containing at least 96% silica and having the thermal performance of a refractory material.

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4,381,640

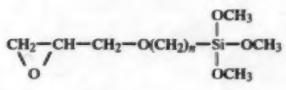
## PROCESS FOR THE PRODUCTION OF REINFORCED RUBBER ARTICLES

Kalidas Chakravarti, Richmond, and Stanley D. Lazarus, Petersburg, both of Va., assignors to Allied Corporation, Morris Township, N.J.

Filed Nov. 17, 1980, Ser. No. 207,493
Int. Cl.³ D02G 3/02, 3/36
U.S. Cl. 57—242 11 Claims

1. In a process for the production of reinforced rubber articles formed from polyester yarn twisted into cord and embedded into rubber stock, the steps comprising:

treating the yarn with an overfinish composition comprising about 60 to 90 weight percent of water and about 10 to 40 weight percent of an oil portion, the oil portion comprising about 50 to 70 weight percent of hexadecyl stearate, about 3 to 9 weight percent of glycerol monooleate, about 2 to 8 weight percent of decaglycerol tetraoleate, about 5 to 12 weight percent of ethoxylated tall oil fatty acid, about 5 to 15 weight percent of sulfonated glycerol trioleate, about 1 to 10 weight percent of ethoxylated alkyl amine, and about 2 to 45 weight percent of a silane having the structural formula:



wherein n=2 to 5; and

including from about 4 to 25 parts per hundred parts of rubber of hydrated silica particles in the rubber stock.

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4,381,641

## SUBSTOICHIOMETRIC COMBUSTION OF LOW HEATING VALUE GASES

Ajay M. Madgavkar, Pittsburgh, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 23, 1980, Ser. No. 161,857
Int. Cl.³ F02C 3/22
U.S. Cl. 60—39.06 18 Claims

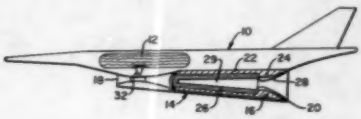
1. A method for the recovery of energy from a gas stream having an average heating value in the range of about 15 to about 200 Btu/scf and having a combustible component comprising one or more hydrocarbons having from one to about seven carbon atoms, carbon monoxide or mixtures thereof and up to about 50 mol percent hydrogen, which comprises the steps analyzing said gas stream for the presence of arsine, adjusting the quantity of arsine in said gas stream as necessary to provide an amount between about 0.1 ppm and about 50 ppm arsine, passing said gas stream admixed with air for combustion at an average air equivalence ratio of between about 0.2 and about 0.95 in contact with an oxidation catalyst in at least one combustion zone at a temperature high enough to initiate and maintain combustion of said gas stream, and utilizing the heat energy produced in said gas stream by said combustion.

4,381,642

## RAMJET ENGINE

Harry L. Giles, Jr., Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 20, 1980, Ser. No. 161,246
Int. Cl.³ F02K 7/18
U.S. Cl. 60—204 5 Claims



1. A subsonic-supersonic ramjet engine comprising a combustion chamber having an air inlet and an exhaust outlet, a generally cylindrical solid ramjet fuel element carried on the inner periphery of said combustion chamber and having formed therein a consumable solid fuel nozzle at its aft end, said solid fuel nozzle limiting the gases passing through the interior of the fuel element to subsonic velocities until it is consumed along with the remainder of the fuel element, and means for injecting into said combustion chamber a liquid fuel after the solid fuel element is substantially consumed and gases at supersonic speeds flow through said combustion chamber.

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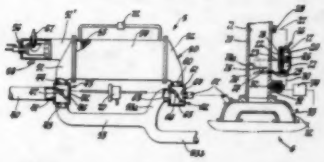
4,381,643

## DIESEL EXHAUST CLEANER AND BURNER SYSTEM WITH CONSTANT BURNER AIR MIXTURE SUPPLY

Terrence L. Stark, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1981, Ser. No. 289,246
Int. Cl.³ F01N 3/02
U.S. Cl. 60—303 4 Claims

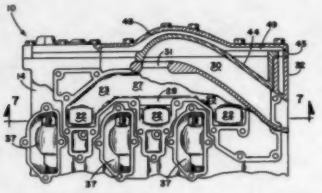


1. An exhaust cleaner and burner system for use with a diesel engine having a throttle controlled induction system maintaining a substantial constant depression in the intake manifold of the engine; said system including an exhaust passage for receiving exhaust gas from the engine; first and second passage means each having an inlet end and an outlet end, a first valve means operatively connected to said exhaust passage and to said inlet ends of said first and second passage means for controlling flow from said exhaust passage selectively to said first and second passage means, a filter positioned in at least said first passage means intermediate the inlet end and outlet end thereof; a heater means and an air inlet passage for the inlet of secondary air at atmospheric pressure operatively associated with at least said first passage means at the inlet end thereof; and, a second valve means operatively associated with said first and second passage means at the outlet ends thereof and with the intake manifold which is operative to control flow from at least said first passage means to the intake manifold whereby manifold vacuum can be used to draw atmospheric air through said air inlet passage, with the air heated by said heater means to effect incineration of particulates trapped on said filter.

## 4,381,644
## EXHAUST SYSTEM FOR THREE CYLINDER TWO-CYCLE ENGINES

David W. Kusche, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 28, 1980, Ser. No. 211,380
Int. Cl.³ F02B 27/02
U.S. Cl. 60—313 7 Claims



1. A two-cycle, in-line engine comprising:

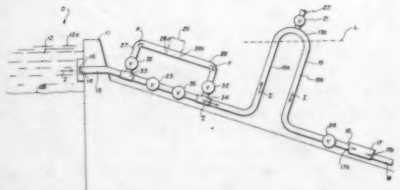
(A) a die cast cylinder block having three horizontal cylinders arranged in a vertical back, a head face at one end of said cylinders, an exhaust face on one side of said cylinders, a bottom face below said cylinders, three vertically spaced exhaust ports in communication with said cylinders on said one side of said cylinders, and an exhaust cavity in communication with said exhaust ports and having a vertically extending trunk open on said exhaust face of said block and having a centrally located manifold opening through said head face of said block; and

(B) a die cast exhaust manifold cover attached directly to the exhaust face of said block to form with said exhaust cavity an exhaust manifold, said exhaust manifold having substantially equal length acoustical paths between said opening and each of said exhaust ports and substantially equal acoustical distance between any two of the exhaust ports.

## 4,381,645
## POWER UNIT FOR DAM

Charles W. Galuska, G.D. Box 65, APO San Francisco, Calif. 96555

Filed Jan. 5, 1981, Ser. No. 222,635
Int. Cl.³ F16D 31/02
U.S. Cl. 60—398 9 Claims

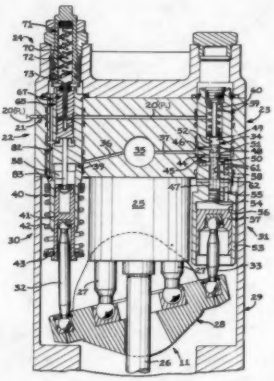


1. A power unit for a dam having a vertical barrier for retaining a body of water on one side to provide a pressure head comprising, in combination, water driven power generating means, a downwardly inclined main conduit communicating at one end with a horizontal conduit end portion communicating with said body of water through said vertical barrier at a lower portion thereof and communicating at the other end with said power generating means, said conduit having an upwardly extending U-shaped section intermediate the ends of said conduit, said U-shaped section including a bight portion disposed above the level of said body of water, first valve means in said conduit for permitting water to flow from said body of water through said conduit including said U-shaped section into said power generating means and means for initially filling said U-shaped section of said conduit with water flowing to provide a siphon action and to increase the pressure of water flowing into said power generating means wherein said means for initially filling said conduit U-shaped section comprises a pump in a conduit branch having an inlet and an outlet in parallel with said conduit upstream said U-shaped section and means including second valve means for communicating said pump conduit branch inlet and outlet with said conduit.

## 4,381,646
## TORQUE AND HIGH PRESSURE LIMITING CONTROL FOR VARIABLE DISPLACEMENT PUMPS

Walter Z. Ruseff, New Lenox, and James E. Schimpf, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01195, § 371 Date Sep. 12, 1980, § 102(e) Date Sep. 12, 1980, PCT Pub. No. WO82/01047, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 12, 1980, Ser. No. 261,101
Int. Cl.³ F16D 31/02; F04B 49/08
U.S. Cl. 60—452 14 Claims



1. In a fluid circuit (10) having a fluid actuator (13), a variable displacement pump (11) including a control member (28) movable between first and second displacement positions, first biasing means (30) for urging said control member (28) towards its first displacement position, and second biasing means (31) for urging said control member (28) towards its second displacement position in opposition to said first biasing means (30) and in response to a load pressure signal communicated thereto from said fluid actuator (13), the improvement comprising:

modulating means (24) for modulating said load pressure signal in said second biasing means (31) to vary the displacement of said pump (11) in response to the magnitude of said load pressure signal and the position of said control member (28).

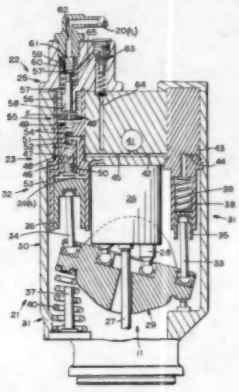
## 4,381,647
## LOAD-PLUS VALVE FOR VARIABLE DISPLACEMENT PUMPS

Walter Z. Ruseff, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 12, 1980, Ser. No. 261,108
Int. Cl.³ F16H 39/46
U.S. Cl. 60—452 10 Claims

1. In a fluid circuit (10) having a fluid actuator (13), a variable displacement pump (11) including a control number (29) movable between first and second displacement positions, first biasing means (31) for urging said control member (29) towards its first displacement position, second biasing means

(32) for urging said control member (29) towards its second displacement position in opposition to said first biasing means (31) and in response to a variable control pressure ($P_C$), first means (23) for varying said control pressure ($P_C$) in proportion to the discharge pressure ($P_D$) of said pump (11), and second means (25) for controlling said first means (23) to modulate said control pressure ($P_C$) in response to variations in a load pressure ($P_L$) received from said fluid actuator, the improvement comprising:



means (55) for mechanically isolating and separating said second means (25) from said first means (23), freeing said first means (23) to function independently of said second means (25) in response to said load pressure ($P_L$) falling below a predetermined level, and for mechanically interconnecting said first (23) and second (25) means to modulate said control pressure ($P_C$) by said second means (25) in response to said load pressure ($P_L$) exceeding said predetermined level.

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**4,381,648**

## STIRLING CYCLE APPARATUS WITH METAL BELLOWS SEAL

**Charles Balas, Jr., Denville, N.J., assignor to North American Philips Corporation, New York, N.Y.**

**Filed Dec. 29, 1980, Ser. No. 220,948**

**Int. Cl.³ F02G 1/04**

**U.S. Cl. 60—517** **12 Claims**

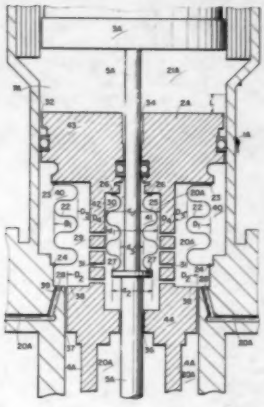
1. In a thermodynamic cycle apparatus including a cylinder having a bore and cylinder walls; a piston and an other element axially spaced apart and reciprocated within said bore; a hollow piston rod fixed to and extending downward from said piston and an other element rod fixed to and extending downward from said other element, through said piston and through the bore of said hollow piston rod for relative axial reciprocation; said cylinder and said piston defining a variable volume compression space for containing a working gas, and a space below said piston in said cylinder bore and including said piston and other element rods,

the improvement wherein a portion of the cylinder wall and said piston rod define an outer annular space therebetween, and the hollow piston rod inner wall and said other element rod define an inner annular space therebetween, and

said apparatus further comprises a metal outer bellows and a metal inner bellows, each having a generally cylindrical shape with opposite top and bottom ends, said outer bellows being secured in said outer annular space, with its top end fixed and hermetically sealed to said piston and its bottom end similarly fixed to said cylinder, arranged so as to define and separate an outer liquid space and an outer gas space; said inner bellows being secured in said inner annular space, with its top end fixed and hermetically sealed to said piston, and its bottom end similarly fixed to said other element rod, arranged so as to define and separate an inner liquid space and an inner gas space,

means for filling said inner and outer liquid spaces with a substantially incompressible liquid,

means for maintaining the volume of each of said inner and



outer liquid spaces, and the liquid therein, substantially constant, and

means for maintaining working gas in said inner and outer annular gas spaces at a pressure greater than that of said liquid in said liquid spaces,

whereby said working gas is prevented from flowing from said compression space past said piston to said inner or outer liquid spaces.

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**4,381,649**

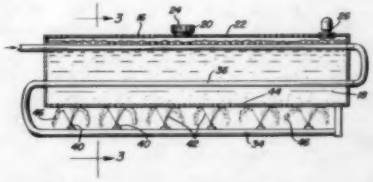
## $CO_2$ SNOW PRODUCER WITH HEAT EXCHANGER

**Paul R. Franklin, P.O. Box 37978, Jacksonville, Fla. 32205**

**Filed Mar. 8, 1982, Ser. No. 355,865**

**Int. Cl.³ F17C 3/00**

**U.S. Cl. 62—47** **9 Claims**



1. A refrigerant snow producer including a refrigerant supply line having a first end communicated with a source of liquid refrigerant under pressure, a second end of said supply line including a plurality of spray jet outlet means opening outwardly therefrom, a heat exchange structure of high heat exchange capacity, said plurality of spray jet outlet means being arranged closely spaced from and to spray spaced jets of liquid refrigerant onto heat exchange surfaces of said heat exchanger structure, an intermediate portion of said supply line being in good heat exchange relation with said heat exchange structure, whereby the absorption of heat from said heat exchanger by the spraying of jets of liquid refrigerant thereon will in turn absorb heat from said intermediate portion of said line and reduce the temperature of the refrigerant flowing

therethrough to a temperature at least near the temperature of the triple point of said refrigerant thereby enabling almost complete transformation of the liquid refrigerant being discharged from said spray jet outlet means directly into refrigerant snow and with minimal portions of the jet discharged liquid refrigerant being transformed into refrigerant gas.

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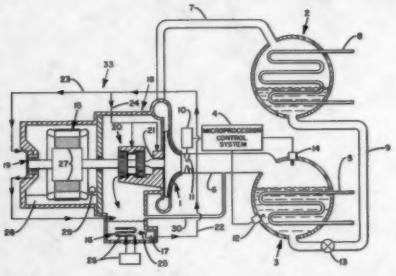
**4,381,650**

## ELECTRONIC CONTROL SYSTEM FOR REGULATING STARTUP OPERATION OF A COMPRESSOR IN A REFRIGERATION SYSTEM

**Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Nov. 27, 1981, Ser. No. 325,616**
**Int. Cl.³ F25B *31/02***
**U.S. Cl. 62—157** **4 Claims**



**1.** A control system for controlling flow of vaporous refrigerant from an evaporator to a compressor in a hermetically sealed refrigeration system during startup of the system comprising:

means for periodically measuring a refrigerant pressure or temperature at a location between the compressor and the evaporator during startup of the refrigeration system and for generating an electrical signal corresponding to the magnitude of each measured pressure or temperature;

electronic control means for receiving the electrical signals corresponding to the measured pressures or temperatures, for determining the actual refrigerant pressure pulldown rate from the received electrical signals, for comparing each actual pulldown rate to a predetermined pulldown rate and for generating a first electrical control signal when the difference between the predetermined pulldown rate and the actual pulldown rate is less than a first preselected limit and to generate a different, second electrical control signal when the difference between the predetermined pulldown rate and the actual pulldown rate is greater than a second preselected limit; and

means for adjusting the capacity of the compressor in response to the electrical control signals from the electronic control means to adjust the actual pulldown rate to approximately equal the predetermined pulldown rate during startup of the refrigeration system.

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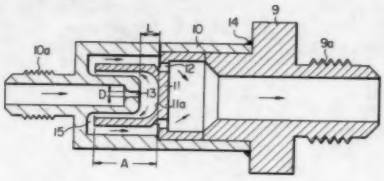
**4,381,651**

## SILENCER IN A REFRIGERATION SYSTEM

**Koji Kubo; Mineo Nishikawa, both of Kariya, and Hikaru Sugi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jul. 16, 1981, Ser. No. 283,913**
**Claims priority, application Japan, Jul. 17, 1980, 55-96891**
**Int. Cl.³ F25D *19/00***
**U.S. Cl. 62—296** **4 Claims**

**1.** A silencer in a refrigeration system comprising a casing, an orifice of a small diameter arranged in said casing for jetting a refrigerant into said casing and an obstruction disposed in said casing at a position spaced from said orifice within a distance which is between two and five times as large as the diameter of said orifice, whereby generation of jet noise generated when said refrigerant is jetted from said orifice is suppressed, said obstruction having a bar-shaped central portion



projecting from a disc-like base portion toward said orifice, said base portion having a peripheral portion and being provided with a plurality of small aperture formed in said peripheral portion thereof.

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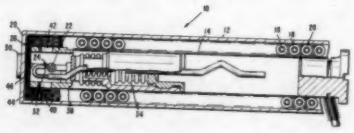
**4,381,652**

## DEMAND FLOW CRYOSTAT

**Wallace Y. Kunimoto, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.**

**Filed Jan. 15, 1982, Ser. No. 339,345**
**Int. Cl.³ F25B *19/00***
**U.S. Cl. 62—514 JT** **7 Claims**



**1.** A demand flow cryostat comprising:

a tubular outer housing having a support thereon for supporting an electronic device to be cooled;

an expansion nozzle directed toward said support, a tube connected to said expansion nozzle for delivering pressurized cryogen to said expansion nozzle;

a valve needle positioned adjacent said expansion nozzle for controlling the outflow of pressurized cryogen from said expansion nozzle, a temperature sensor positioned to sense the temperature in the region to be cooled adjacent said support, said temperature sensor being connected to said valve needle in said nozzle to control the outflow of cryogen from said expansion nozzle to control the amount of cooling in the space to be cooled adjacent said support; and

cryogen flow control means positioned around said expansion nozzle and within the space to be cooled adjacent said support for controlling the flow of cryogen away from said nozzle to stabilize temperature at said support, said flow control means comprising a perforated tube having an open end positioned around said nozzle with its open end directed toward said support and its perforations directed away from said support, said flow control means also including felt positioned within said outer housing and positioned against said support.

4,381,653

## ARTICLE SIMULATING BODY APPENDAGE MOVEMENTS OF INSECT

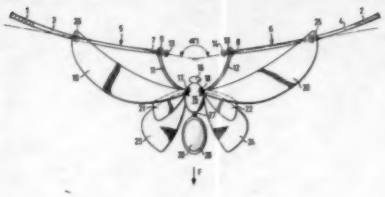
Walter Diehl, Flüggenstr. 12, 8000 Munich 19, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 245,843

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011923; Mar. 27, 1980, 8008495[U]

Int. Cl.³ A44C *25/00*

U.S. Cl. 63—2 12 Claims



1. An article of jewellery, especially simulating an insect such as a butterfly, comprising:

(a) a body member (15),

(b) a pair of first rigid wires (11,12) resembling insect feelers fixedly secured to the body member and extending outwardly from a forward portion thereof in a generally U configuration,

(c) a pair of second rigid elongated wires (5,6) having outer ends (3,4) attached to ends (1,2) of a necklace,

(d) first joint means (9,10; 13,14) individually and freely articulating inner ends of the second wires to free ends of the first wires,

(e) a pair of equally configured elongate members,

(f) second joint means individually articulating an inner end of each elongate member to the body member, and

(g) coupling means individually and slidably connecting an outer end of each elongate member to the second wires at points laterally remote from the body member, whereby upon movement of a wearer the elongate members hinge at their inner ends proximate the body member and slide on the second wires at their outer ends, thereby simulating body appendage movements of an insect.

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4,381,654

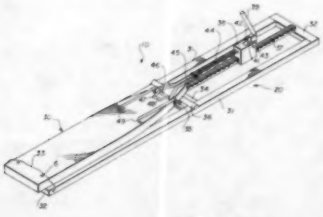
## FUR STRETCHER

Lee M. Baldridge, 1263 Tehama, Oroville, Calif. 95965

Filed Aug. 19, 1981, Ser. No. 294,305

Int. Cl.³ C14B *1/26*

U.S. Cl. 69—19.2 7 Claims



1. A device for stretching a fur pelt and the like comprising, in combination:

a first rack means for initially receiving and stretching the pelt,

a second means for receiving said first rack means and a portion of the pelt

and connection means for fastening together said first and second rack means whereby the pelt is stretched further by displacing the pelt while said first rack means is held stationary by said second rack means.

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4,381,655

## MACHINE FOR TREATING HIDES OR THE LIKE

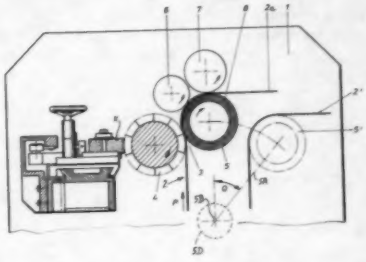
Willi Trütschel, Rosbach, Fed. Rep. of Germany, assignor to Maschinenfabrik Moenus AG, Frankfurt, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,603

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948719

Int. Cl.³ A43D *89/00;* C14B *17/14*

U.S. Cl. 69—38 11 Claims



1. In a tanning machine, the combination of a frame; an elongated severing device rotatably mounted in said frame; and grinding means for said severing device, including stationary straight first guide means mounted in said frame and extending in parallelism with the axis of said severing device, a first carriage reciprocable along said guide means, means for reciprocating said carriage along said guide means, second guide means mounted on said carriage and extending substantially radially of said severing device, a second carriage reciprocable along said second guide means, a grinding tool for said severing device, said tool being mounted on said second carriage, and means for moving said second carriage with said grinding tool along said second guide means in response to reciprocation of said first carriage along said first guide means.

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4,381,656

## AUTOMOBILE DOOR ASSEMBLY HAVING A DOOR LOCKING DEVICE

Hiroshi Hayakawa, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Nov. 28, 1980, Ser. No. 211,226

Claims priority, application Japan, Nov. 30, 1979, 54-156042; Nov. 30, 1979, 54-156043

Int. Cl.³ E05B *9/08*

U.S. Cl. 70—451 6 Claims

1. An automobile door assembly comprising:

a door outer panel having outer and inner surfaces and formed with an attachment opening;

a spring retainer adapted to be mounted on the door panel at the attachment opening thereof, said spring retainer including a central aperture, a flange having a seat surface adapted to be seated on the outer surface of the door panel around the attachment opening, and at least a pair of legs extending from said flange through the attachment opening beyond the inner surface of the door panel, each of said legs having a free end portion formed with a pawl;

a retaining spring engaged with said pawls of the legs and being in contact with the inner surface of the door panel;

a door locking device including a lock body inserted through the aperture in the spring retainer and engaged with the retaining spring to be held in position, a shaft rotatably mounted in said lock body, a connecting lever, and a lock actuating member;

first connecting means for removably connecting one end of the connecting lever to the rotatable shaft of the door locking device; and

second connecting means for connecting said connecting lever and said lock actuating member.

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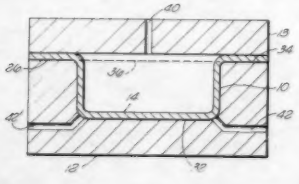
**4,381,657**

## METHOD OF REMOVING FORMED PARTS FROM A DIE

**C. Howard Hamilton, Thousand Oaks, and Paul R. Puhaczewski, Torrance, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed May 19, 1980, Ser. No. 151,497**
**Int. Cl.³ B21D *26/04***
**U.S. Cl. 72—60** **4 Claims**




1. A method of removing a formed part from a die, said part produced by clamping a preform between first and second dies, bringing said preform to within an elevated temperature range suitable for superplastic forming of said preform, and applying pressure to said preform to superplastically form at least a portion of said preform into a cavity of said first die, comprising the steps of:

cooling said formed part to within a second elevated temperature range which is less than that suitable for superplastic forming of said preform;

drawing a vacuum between at least a portion of said part and said second die while said part is within said second temperature range such that said part is secured to said second die; and

separating while said part is within said second temperature range, said second die from said first die such that said part is withdrawn from said cavity of said first die.

**4,381,658**

## METHOD OF I-SECTION ROLLING IN CONTINUOUS MILL

**Alexandr A. Kugushin, prospekt Metallurgov, 25, kv. 128; Vladimir N. Bespalov, ulitsa Kurako, 16, kv. 85; Jury O. Labetsky, ulitsa Kirova, 56, kv. 61; Vyacheslav I. Druzin, ulitsa Metallurgov, 37, kv. 47, all of Novokuznetsk Kemerovskoi oblasti; Vitaly K. Smirnov, ulitsa Malysheva, 130-b, kv. 31, and Vladislav A. Shilov, ulitsa S, Kovalevskoi, 1, kv. 77, both of Sverdlovsk, all of U.S.S.R.**

**Filed Jan. 26, 1981, Ser. No. 228,610**
**Claims priority, application U.S.S.R., Dec. 28, 1979, 2859614**
**Int. Cl.³ B21B *1/12***
**U.S. Cl. 72—234** **3 Claims**

1. A method of rolling I-sections in a continuous mill, comprising the steps of:

(1) rolling a blank in a horizontal slitting pass to form a roughly I-shaped bar;

(2) rolling said bar in a vertical reduction pass until outer sides of said bar have slopes approximately equal to outer sides of dead flanges of a next-in-order horizontal closed roughing beam pass, and the width of said bar is less than the width of said next-in-order pass;

(3) rolling said bar in a horizontal closed roughing beam pass;

(4) rolling live flanges of said bar in a vertical bending pass until the slopes of outer sides of live flanges of said bar are approximately equal to the magnitude and direction of the slopes of the outer sides of dead flanges of a next-in-order horizontal closed roughing beam pass, and the width of said bar is not reduced;

(5) rolling said bar in a horizontal closed roughing beam pass;

(6) rolling live flange of said bar in a vertical bending pass, wherein bent-out live flanges of said bar are set upright;

(7) rolling said bar in a horizontal open beam pass to form a rough finished I-section, wherein the web thickness reduction ratio and the flange height reduction ratio are both in the range 1.1–1.3;

(8) rolling said rough finished I-section in an universal beam pass to form a finished I-section;

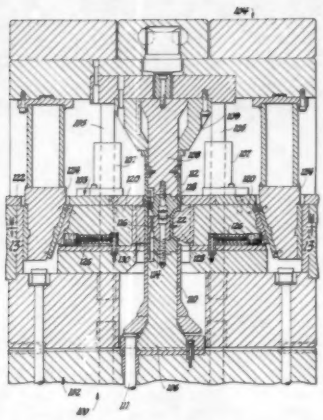
wherein outer sides of live flanges of each of said horizontal closed roughing beam passes have a slope of 15–100 percent and outer sides of dead flanges of said horizontal closed roughing beam pass have a slope of 8–12 percent; and wherein the slopes of outer sides of flanges of successive horizontal closed roughing beam passes are in alternate directions.

4,381,659

## METHOD OF MANUFACTURING UNIVERSAL JOINT HOUSING

Mack D. Welch, Bridgeport, and William B. Speer, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 9, 1981, Ser. No. 232,905
Int. Cl.³ B21K 21/08
U.S. Cl. 72—340 4 Claims



1. A method of manufacturing a housing for a tri-pot universal joint comprising the steps of:

providing a predetermined length of thick walled tube,

forming the middle of the thick walled tube so as to produce a tri-lobal middle section and irregular end portions which remain sufficiently intact to machine a circular band at each end of the tube,

machining one end portion of the formed tube to provide a circular band at one end of the formed tube,

broaching the lobes of the tri-lobal section in the middle of the formed tube to provide three internal, curved drive tracks which are shaped to radially capture curved drive rollers, and

machining an opposite end portion of the formed tube to provide a circular band at the opposite end of the formed tube.

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4,381,660

## METHOD FOR PREVENTING WELD FRACTURE

Jack M. Beigay, Freeport, and Remus A. Lula, Natrona Heights, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Feb. 9, 1981, Ser. No. 232,756
Int. Cl.³ B21D 11/00
U.S. Cl. 72—342 6 Claims

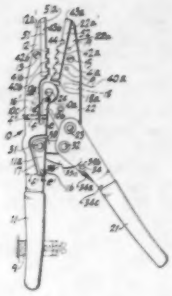
1. A method for preventing cracking at the weld area during deformation of an autogenous weldment of metastable stainless steel, said method comprising cooling only said weld area with a pressurized $CO_2$ spray and deforming said weld area during said cooling to form more martensite in the weld than in the base metal.

4,381,661

## TOOL HAVING TWO WORKING JAWS

Hans Wiener, Täby, and Hans Undin, Akersberga, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,806
Int. Cl.³ B21D 7/06
U.S. Cl. 72—409 22 Claims



1. A tool comprising two arm members, two working jaws each supported on a different one of said arm members, said arm members and said working jaws supported thereon arranged for relative movement between open and closed positions, drive means connected to at least one of said arm members for imparting to said arm member a closing movement into the closed positions of said arm member and working jaws in response to an operating force applied to said drive means and transmitted along a force transmitting path to one of said working jaws, and at least one pivot means operatively and pivotally connecting one of said arm members to at least one of another said arm member and said drive means, said pivot means including a pivot member, bearing means engaging said pivot member, and resilient support means for said bearing means for allowing further relative closing movement to be transferred to said working jaws only when said support means have reached a certain degree of yield.

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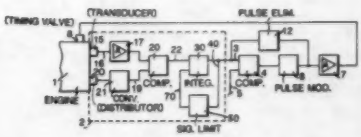
4,381,662

## METHOD AND DEVICE FOR REGULATING THE SIGNAL LEVEL FROM A TRANSDUCER CONNECTED TO AN INTERNAL COMBUSTION ENGINE

Sten R. Jiewertz, Järna, Sweden, assignor to Saab-Scania Aktiebolag, Sweden

Filed Feb. 5, 1981, Ser. No. 231,751
Claims priority, application Sweden, Feb. 11, 1980, 8001072
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 9 Claims




1. A method of regulating the signal level in detect of abnormal combustion processes, so-called knocking, in an internal combustion engine, said method comprising the steps of:

sensing a parameter having a predetermined relationship to conditions prevailing in an engine during combustion

therein, generating a signal representing said parameter, and using the level of said signal as a measure of the level of knocking occurring in the engine;

comparing the level of said signal to a preselected signal level representing a preselected level of knocking;

when the knocking exceeds that level required to drive the level of said signal beyond said preselected level, limiting the level of said signal to a level corresponding to said preselected signal level during a preselected period of time; and

after said preselected period of time, allowing said signal to assume a level proportional to the actual knocking level.

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**4,381,663**

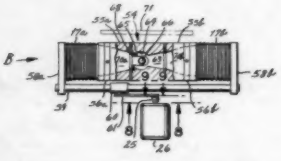
## FLUID OSCILLATION MATERIALS TESTING APPARATUS AND METHODS

**Wilbur M. Swanson, St. Louis County, Mo., assignor to Washington University, St. Louis, Mo.**

**Filed Mar. 6, 1981, Ser. No. 241,078**

**Int. Cl.³ G01N *3/36***

**U.S. Cl. 73—37** **19 Claims**



1. Materials testing apparatus for testing of a test sample by application of repeated oscillatory forces or fluid motion thereon, characterized by means defining fluid passages on opposite sides of said test sample, means for clamping said test sample between said fluid passages, and fluid oscillation means for causing axial oscillating flow of fluid within said passages relative to the opposite sides of said test sample whereby said test sample is caused to undergo repeated oscillating forces or motions produced by oscillation of said fluid, said fluid oscillatory means comprising a pair of bellows connected respectively to said fluid passages at opposite ends of a test fixture clamping said test sample, and defining said fluid passages, said bellows being configured for alternate contraction and expansion to cause oscillating movement of fluid within said passages, and drive means for causing repeated contraction and expansion of said bellows, said test fixture and said pair of bellows being aligned along a single axis with said test fixture being interposed between said bellows, said fluid passages defining a closed fluid environment for testing of said test sample, said fluid passages extending axially from opposite sides of said test sample for providing axial oscillatory forces or motions upon said test sample.

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**4,381,664**

## METHODS OF AND APPARATUS FOR THE DETECTION OF AIRBORNE PARTICLES

**Raymond P. Clark, London, and William V. Hunt, Lytchett Matravers, both of England, assignors to Watkins and Watson Limited, Dorset, England**

**Filed Nov. 13, 1980, Ser. No. 206,665**

**Claims priority, application United Kingdom, Nov. 13, 1979, 7939244**

**Int. Cl.³ G01M *3/20***

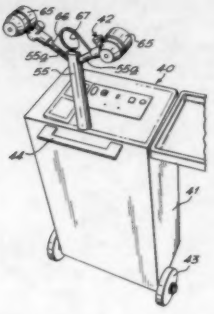
**U.S. Cl. 73—40.7** **10 Claims**

9. Apparatus for determining the presence of identifiable particles in air, comprising:

a casing;

air induction means disposed within the casing; and,

air sampling means storable within the casing and operable to collect any of said particles in air gathered by said air induction means, said air sampling means comprising air sensor means mounted on branches formed at one end of



a tubular support, the other end of which is connected to the air induction means.

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**4,381,665**

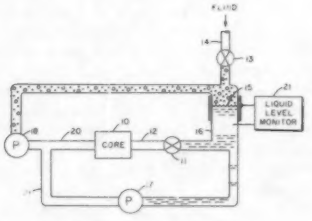
## METHOD FOR DETERMINING SATURATION CHARACTERISTICS OF A POROUS MATERIAL

**Joel L. Levine, Garland, and Benjamin F. Marek, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Jul. 8, 1981, Ser. No. 281,451**

**Int. Cl.³ G01N *5/02***

**U.S. Cl. 73—73** **5 Claims**




1. A method for determining the characteristics of a porous material from a subterranean formation, comprising:

(a) establishing a closed fluid system of a multiphase fluid, one phase being a liquid hydrocarbon and another phase being an insoluble displacing liquid, said hydrocarbon phase and said displacing liquid phase separating and forming a fluid interface between said phases,

(b) placing a sample of said porous material into said closed fluid system,

(c) detecting the level of said fluid interface under static conditions,

(d) pumping a portion of said hydrocarbon phase into a first end of said sample,

(e) pumping a portion of said displacing liquid phase into said first end of said sample, whereby said sample is saturated with said hydrocarbon phase and said displacing liquid phase and

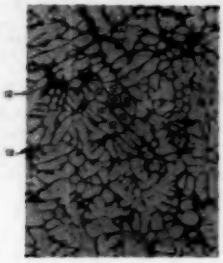
(f) detecting a change in the level of said fluid interface in response to the flow of the hydrocarbon phase and displacing liquid phase through said sample, said fluid change being representative of the saturation characteristics of said porous material.

**4,381,666**

## METHOD FOR THE NONDESTRUCTIVE TESTING OF CELLULAR METALLICS

**Frederick J. Feiertag, Seattle, and Dale L. McLellan, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Apr. 27, 1981, Ser. No. 257,679**
**Int. Cl.³ G01N *33/20***
**U.S. Cl. 73—87** **9 Claims**



1. A method for nondestructively measuring the ductility of a cellular metallic, comprising:
providing a cellular metallic,
selecting an arbitrary zone of said metallic wherein a measurement is to be made,
counting substantially all of the metal cells within a surface area of said zone, and
correlating the number of said metal cells per unit area to the ductility of said zone of said cellular metallic.

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**4,381,667**

## MEASUREMENT OF BOREHOLE TEMPERATURE

**Thomas L. Gordon, 42 Olive Rd., Millendon, Western Australia, Australia**

**Filed Apr. 29, 1981, Ser. No. 258,749**
**Claims priority, application Australia, May 2, 1980, PE3388**
**Int. Cl.³ E21B *47/06***
**U.S. Cl. 73—154** **8 Claims**

1. A borehole survey tool of the type having a chamber, a borehole survey instrument in said chamber, and a shock absorbing assembly for supporting the survey instrument in the chamber, said shock absorbing assembly including a substantially helical return spring for exerting a biasing force on said survey instrument, and wherein there is provided means for measuring borehole temperature comprising a casing defining a passage, a maximum temperature registering thermometer mountable within said casing passage, said casing having a body portion and a shoulder portion, said casing being mountable in the borehole survey tool casing with the body portion received within the helical spring and the shoulder portion being engaged with one end of said helical spring.

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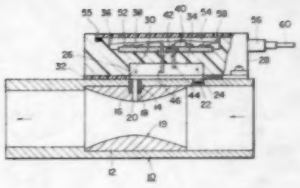
**4,381,668**

## GAS FLOW MEASURING APPARATUS

**Kanemasa Sato; Sadayasu Ueno; Kazuhiko Miya; Yoshishige Oyama, and Yutaka Nishimura, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 15, 1980, Ser. No. 178,597**
**Claims priority, application Japan, Aug. 22, 1979, 54-105899**
**Int. Cl.³ G01F *5/00, 1/68, 1/22***
**U.S. Cl. 73—202** **13 Claims**



1. An apparatus for measuring the flow of a gas comprising:
a main supply path member through which said gas flows, said main supply path member having first and second openings formed in the wall thereof and spaced by a predetermined distance in the direction of flow of said gas;
a restrictive element disposed in said main supply path member between said first and second openings;
a bypass member detachably fixed to the outside of said main supply path member and provided with an elongated groove, said elongated groove being communicated at its one end with said first opening and at its other end with said second opening, said groove delimiting a predetermined cross-sectional area;
a spacer interposed between said main supply path member and said bypass member and provided with an opening corresponding to said groove of said bypass member, the opening of said spacer delimiting a cross-sectional are cooperating with said groove so as to vary the cross-sectional area of said groove in accordance with the thickness of said spacer; and
a gas flow meter including a pair of resistance members exposed to the inside of said groove of said bypass member.

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**4,381,669**

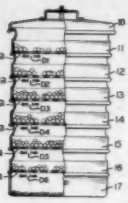
## METHOD AND APPARATUS FOR DETERMINING THE NUMBER OF SEEDS PER UNIT WEIGHT IN A SEED SAMPLE

**Roger L. Peters, 3080 N. Lentz, Oak Harbor, Ohio 43449**

**Filed Jan. 19, 1981, Ser. No. 226,009**
**Int. Cl.³ G01N *15/02***
**U.S. Cl. 73—432 PS** **8 Claims**

1. A method of determining the number of seeds per unit weight of a quantity of seeds of various sizes, comprising the steps of:
a. obtaining a random sample of seeds from the quantity of seeds;
b. sorting said sample of seeds into a predetermined number of size ranges;
c. determining a characteristic of the seeds in each of said size ranges;

d. applying an associated constant to each of said characteristics to obtain a value for each of said size ranges;



e. combining said values to obtain the number of seeds per unit weight for the quantity of seeds.

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**4,381,670**

## SUPPORT SYSTEM FOR HARD BEARING BALANCING MACHINES

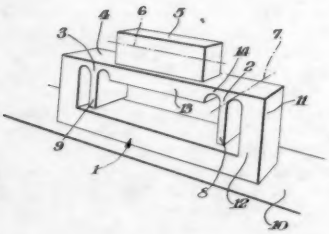
**Hatto G. A. Schneider, Heppenheim, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany**

**Filed Feb. 18 1981, Ser. No. 235,673**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011110**

**Int. Cl.³ G01M *1/04***

**U.S. Cl. 73—471** **10 Claims**



1. A support system for hard bearing balancing machines for taking up a rotational body having an axis of rotation and having oscillation transducers for measuring the imbalance, comprising a mounting plate for the rotational body, the mounting plate having at least two joints permitting articulation for each measuring plane, the mounting plate being secured to a mounting base, the joints each having an axis, the axis of the joints proceeding at right angles to the axis of the rotational body, the mounting plate being subjected through the imbalance to a force or displacement, and an oscillation pickup transducer being constructed and arranged to take up the force or the displacement in each measuring plane.

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**4,381,671**

## TIRE MOUNTING SYSTEM

**Robert P. Newton, III, 4011 Priory Clr., Tampa, Fla. 33624**

**Filed Mar. 26, 1981, Ser. No. 247,883**

**Int. Cl.³ G01M *1/04***

**U.S. Cl. 73—487** **8 Claims**

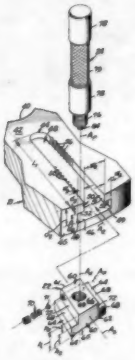
1. A system for mounting the wheel rim of a tire assembly on the drive spindle of a tire correction machine including an adapter unit comprising:

a base assembly defining a central passage therethrough mounting said base assembly on the drive spindle, said base assembly defining an abutment surface thereon oriented normal to the central axis of said central passage and defining a plurality of radially extending slots therein equally spaced from each other circumferentially about the central axis of said base assembly, said slots corresponding in number to the lug holes in the wheel rim,

a plurality of elongate locating pins corresponding in number to the lug holes through the wheel rim, each of said locating pins including an externally threaded attachment section on one end thereof;

a plurality of slide members, one of said slide members slidably mounted in each of said slots for movement therealong, each of said slide members defining an internally threaded hole therethrough oriented parallel to said central axis of said base assembly, said hole adapted to threadedly receive said attachment section on said locating pin therein so that said attachment section will bear against said base assembly to selectively lock said slide member in said slot at selected positions along said slot;

a plurality of hold down tubes corresponding in number to said locating pins, each of said hold down tubes defining a tube passage therethrough sized to slidably receive one of



said locating pins therein to locate said hold down tube coaxial with said locating pin, each of said hold down tubes defining a tapered locating surface on one end thereof adapted to engage the wheel rim around the lug hole through which said locating pin projects to locate the lug hole concentrically of said locating pin when the wheel is positioned between said hold down tube and said abutment surface;

a hold down member adapted to be positioned on said base assembly and engaging those ends of said hold down tubes opposite said tapered locating surfaces thereon; and

a locking member threadedly engaging said base assembly to force said hold down member and said hold down tubes towards said abutment surface so that the wheel rim is captivated between said hold down tubes and said abutment surface to locate the wheel rim with the lug hole circle thereof concentric of said central axis of said base assembly.

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**4,381,672**

## VIBRATING BEAM ROTATION SENSOR

**James M. O'Connor, Farmington, and David M. Shupe, Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Mar. 4, 1981, Ser. No. 240,518**

**Int. Cl.³ G01C *19/56***

**U.S. Cl. 73—505** **43 Claims**

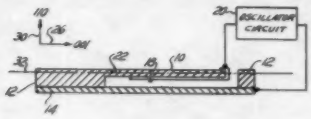
1. A rotation sensor comprising:

a single crystal support structure having an axis of rotation;

an integral cantilever beam supported from said support structure for vibration only in a predetermined plane relative to said support structure and parallel to said axis of rotation, said cantilever beam having a base end attached to said support structure and a free end;

means for vibrating the free end of said cantilever beam in said predetermined plane; and

first sensor means for detecting transverse stresses at said base




resisting rotation of said vibrating cantilever beam about said axis to generate a signal having a value corresponding to the rotational velocity of said support structure about said axis of rotation.

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**4,381,673**

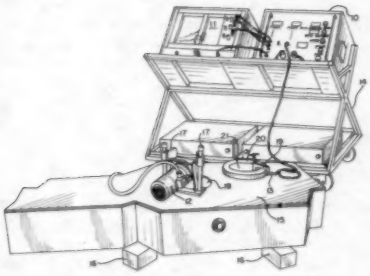
**VIBRATIONAL STRESS RELIEF**

**Bruce Klauba, Princeton, Ill., and Roger Titone, Iowa City, Iowa, assignors to Martin Engineering Company, Neponset, Ill.**

**Filed Dec. 3, 1980, Ser. No. 212,366**

**Int. Cl.³ G01H *13/00*; C21D *1/04***

**U.S. Cl. 73—579** **2 Claims**



1. A method for stress relieving a workpiece by vibration comprising the steps of conducting a pretreatment scan by vibrating the workpiece through a range of predetermined frequencies which range is lower than the natural resonance of the accelerometer by a factor of five or more and recording in two-dimensional form the acceleration of the workpiece as a function of vibrator RPM whereby discernable resonant peaks of the workpiece are displayed, treating the workpiece by vibrating it at the frequency of a plurality of resonant peaks and maintaining the frequency of vibration which excites respective resonant peaks while the amplitude of the peaks increases and/or the frequency of the resonant peaks decreases, and conducting a post-treatment scan by vibrating the workpiece through the same range of frequencies as in the pretreatment scan and utilizing a recorder for recording in two-dimensional form the acceleration of the workpiece as a function of RPM of the vibration to enable ascertainment and comparison of changes in the dynamic loading response as a result of the treatment of the workpiece recorded on a graph displayed by the recorder, and recording in two-dimensional form a plot of the vibrator power as a function of RPM simultaneously with and on the same chart as the acceleration as a function of RPM.

**4,381,674**

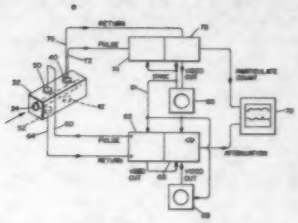
**ULTRASONIC DETECTING AND IDENTIFYING OF PARTICULATES**

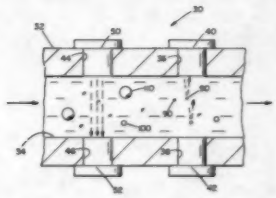
**Leigh R. Abts, Providence, R.I., assignor to Micro Pure Systems, Inc., Smithfield, R.I.**

**Filed Jun. 22, 1981, Ser. No. 276,038**

**Int. Cl.³ G01N *29/00***

**U.S. Cl. 73—599** **9 Claims**





1. A method of identifying solid particles in a flow in an oil recovery system comprising:

sending ultrasonic pulses across the flow,

detecting and counting the reflections of ultrasonic energy from particulates in the flow,

comparing the number of reflections with the amount of attenuation of ultransonic pulses across the flow, thereby determining the percentage of particulates which are solid particles.

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**4,381,675**

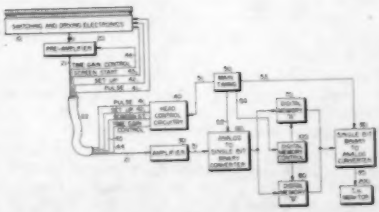
**ULTRASOUND VISUALIZATION SYSTEMS**

**Michael K. Roberts, Arvada; Richard A. Ottosen, Denver, and Matthew L. McConnell, Boulder, all of Colo., assignors to Bioa Corporation, Denver, Colo.**

**Filed Nov. 6, 1980, Ser. No. 204,589**

**Int. Cl.³ G01N *29/04***

**U.S. Cl. 73—620** **21 Claims**



1. A scan conversion system for converting an ultrasound scan signal at a first scan rate into a television video signal at a second scan rate, said system comprising:

(a) analog-to-digital conversion means for converting said

ultrasound scan signal into a stream of single bit digital data, each bit being indicative of the relative amplitude of said ultrasound scan signal at a point in time obtained by a comparison to an amplitude indicated by previously converted digital data;

(b) buffer means for storing said stream of single bit digital data, the loading location in said buffer means being synchronized to frame position of the ultrasound scan signal; and

(c) digital-to-analog conversion means for converting said stored digital data into an analog television video signal, said digital-to-analog conversion means including means for varying said analog television video signal in response to the relative amplitude indicated by each bit in comparison with an amplitude indicated by previously converted digital data.

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## 4,381,676

## APPARATUS FOR SENSING ULTRASONIC WAVES BY OPTICAL MEANS

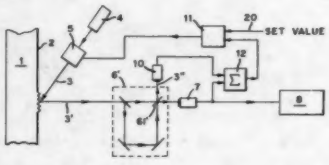
**Walter Kaule, Cologne, and Erik Primbsch, Ahrensburg, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.**

**Filed Apr. 20, 1981, Ser. No. 255,471**

**Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016879**

**Int. Cl.³ G01B 9/02; G01N 29/00**

**U.S. Cl. 73—657** **4 Claims**




1. An apparatus for sensing by optical interference the deformation of a workpiece surface resulting from acoustic energy present in the workpiece comprising:

a laser disposed for directing its beam of light upon a surface portion of the workpiece for sensing such deformation, said surface portion reflecting a portion of the incident light;

light control means disposed for controlling the intensity of the light incident upon said surface portion;

an optical interferometer disposed for receiving the light reflected at said surface portion;

first photoelectric means operatively associated with said interferometer for receiving the light from said interferometer and providing a first electrical output signal commensurate with the deformation of the surface portion to an evaluation signal;

optical beam splitting means cooperatively associated with said interferometer for providing an optical signal which is complementary with respect to the light received by said first photoelectric means;

second photoelectric means coupled for receiving said optical signal and providing a second electrical output signal commensurate with said complementary optical signal;

summing means coupled for receiving said first and said second electrical output signal and providing a third electrical output signal commensurate with the sum of said first and second electrical output signals, and

control means coupled for receiving said third electrical output signal and a set value signal and providing a control signal to said light control means for adjusting said laser beam of light incident upon said workpiece in response to any deviation of said third electrical output signal relative to said set value signal.

## 4,381,677

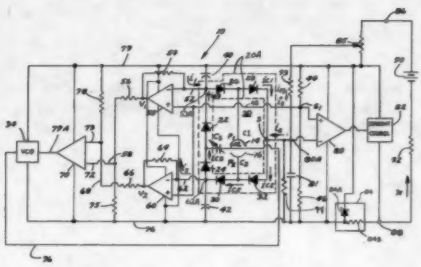
## REACTANCE MEASUREMENT CIRCUIT

**James R. Ruesch, Boulder, Colo.; Roger L. Frick, Eden Prairie, and Earl A. Grindheim, Richfield, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.**

**Filed Jan. 23, 1981, Ser. No. 227,736**

**Int. Cl.³ G01L 9/12**

**U.S. Cl. 73—718** **33 Claims**



1. A circuit for measuring the reactance of an AC reactance means which varies responsive to a condition to be sensed, the circuit comprising:

oscillator means coupled to the AC reactance means for providing a time varying oscillator signal having a variable frequency and a substantially constant peak to peak voltage to the AC reactance means;

rectification means coupled to the oscillator means and to the reactance means for providing charging signals to and discharging signals from the AC reactance means, the charging and discharging signals being a function of the reactance of the AC reactance means; and

control means coupled to the rectification means and to the oscillator means for providing an input control signal to the oscillator means to control the variable frequency thereof thus adjusting the charging and discharging signals as a function of the reactance of the AC reactance means.

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## 4,381,678

## PRESSURE PICK-UP, ESPECIALLY FOR MEASURING THE INTAKE PRESSURE OF INTERNAL COMBUSTION ENGINES

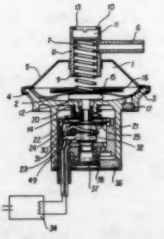
**Claude Lombard, 60 rue Corneille, 78150 Le Chesnay, and Christian Rousseau, 6 allee Suzanne, 92160 Antony, both of France**

**Filed Mar. 18, 1981, Ser. No. 244,874**

**Claims priority, application France, Mar. 21, 1980, 80 06310**

**Int. Cl.³ G01L 9/10**

**U.S. Cl. 73—728** **14 Claims**



1. A pick-up for the intake pressure of a combustion engine of the type with a flexible membrane and electrical translation of the displacement of the membrane comprising:

a spring acting against the membrane;
an adjustment mechanism for positioning the spring acting against the membrane;
a guiding tube for the spring serving as a stop for the membrane;
a closed magnetic casing made of ferrite comprising nested cylinders pierced by a hole at each end of their axes;
a central ferrite magnetic core connected to the membrane and penetrating said closed magnetic casing;
an insulating bobbin disposed within said casing;
a single winding placed on said insulating bobbin around the core and covering a major portion of the core in its deepest position, said bobbin further comprising cylindrical ends extending beyond the magnetic casing on opposite sides thereof so as to form an air pocket between the core and the casing and guide the core in the casing; and
an oscillating electronic circuit connected to said winding which comprises a variable pressure/frequency translator.

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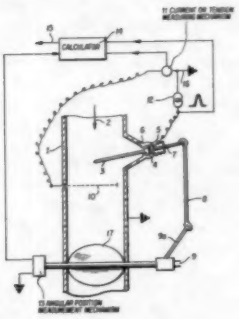
**4,381,679**

## PICK-UP FOR THE MEASUREMENT OF THE VELOCITY OF AN IONIZATION GAS

**Claude Lombard, Le Chesnay, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France**

**Filed Oct. 2, 1980, Ser. No. 193,298**
**Claims priority, application France, Oct. 10, 1979, 79 25174**
**Int. Cl.³ G01F *1/64, 1/70***
**U.S. Cl. 73—861.05** **7 Claims**



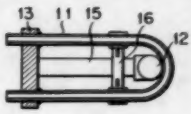
1. A pick-up for measuring the velocity of a gas comprising:
a conduit through which the gas flows;
a valve member mounted in said conduit;
at least one gas ionization electrode positioned in said conduit for emitting ions;
at least one measurement electrode positioned at a certain distance within said conduit from said at least one gas ionization electrode;
a source of pulsating high voltage power connected to said gas ionization electrode;
means for measuring the distance between said gas ionization electrode and said measurement electrode;
means for measuring transit time of said ions from said gas ionization electrode to said measurement electrode and for calculating the velocity to the gas from the measured transit time and the measured distance between said gas ionization electrode and said measurement electrode; and
position coupling means interconnecting said valve member and one of said electrodes for variably positioning said one of said electrodes in response to movement of said valve member.

**4,381,680**

## MASS FLOW METER

**Takeshi Shiota, Houya, Japan, assignor to St Lab., Inc., Tokyo, Japan**

**Filed Dec. 29, 1980, Ser. No. 220,308**
**Int. Cl.³ G01F *1/78***
**U.S. Cl. 73—861.38** **5 Claims**




1. A mass flow meter comprising:
a base;
a "U" shaped conduit having two legs with each leg terminating in an end and through which a fluid to be measured flows, both ends of said "U" shaped conduit being fixed to said base;
a supporting beam, one end thereof being provided with an electromagnet and the other end thereof being fixed to said base, the beam and the conduit being positioned on the base and with respect to one another so that they form a tuning fork structure with the "U" shaped coaduit being oscillated at a natural frequency of said tuning fork structure; and
a torque beam fixed between the two legs of said "U" shaped conduit, at least one strain gauge mounted on the torque beam, said at least one strain gauge being electrically responsive to the torque transmitted to said torque beam from said "U" shaped conduit to measure the amount of torque moment.

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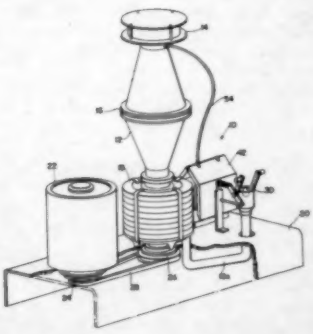
**4,381,681**

## PARTICULATE SAMPLE COLLECTOR

**John P. Bell, Raleigh, N.C., assignor to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.**

**Filed Dec. 8, 1980, Ser. No. 213,799**
**Int. Cl.³ G01N *1/24***
**U.S. Cl. 73—863.03** **13 Claims**



1. A high volume particulate sample collector comprising:
(a) duct means for conducting air,
(b) means for causing air to flow through said duct means,
(c) a filter in said duct means,
(d) means for maintaining constant mass flow rate through said duct means comprising valve means having substantially the same operating characteristics as a rotary butterfly valve, said valve means having an actuator movable between limiting positions and a valve element movable

between open and shut positions corresponding to said actuator limiting positions, pneumatic motor means for moving said valve means comprising a movable element movable over a substantial distance, means for connecting said movable element to said actuator for movement of said actuator by said movable element, and pneumatic conduit means responsive to pressure drop in said duct means for operating said motor.

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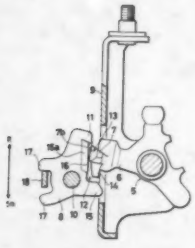
**4,381,682**

## REVERSE-DRIVE BLOCKING LATCH FOR AN AUTOMOTIVE TRANSMISSION

**Satoru Kudo, Fuchu; Kiyokazu Ohkubo, Wako, and Hiroshi Nakayama, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 23, 1980, Ser. No. 220,146**
**Claims priority, application Japan, Dec. 29, 1979, 54-172932**
**Int. Cl.³ G05G *5/02, 9/18;* F16H *57/06***
**U.S. Cl. 74—476** **13 Claims**



1. A reverse drive blocking latch device for an automotive transmission of the type including a gear shift lever and a linkage for converting movements of the gear shift lever into corresponding movements of gear shift forks of the transmission, said latch device comprising:

a latch member positioned in operative relationship with a fork shift member of said linkage, said latch member being supported for movement between two alternative positions;

a projection carried by said fork shift member for cooperation with said latch member when said fork shift member is in a position to effect alternative engagement of a forward drive gear and a reverse drive gear of the transmission;

said latch member including a projection which is engaged by said projection on said fork shift member in movement of said fork shift member in a direction to engage said forward drive gear and which moves said latch member to one of said alternative positions, said latch member further including a lock claw which is positioned in the path of movement of said fork shift member projection when said latch member is in said one position to restrict reverse movement of said fork shift member and inhibit engagement of said reverse drive gear; and

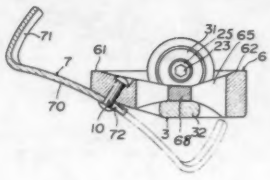
cooperating cam surfaces of said latch member and fork shift member for returning said latch member to the other of its positions upon return of said fork shift member to an intermediate neutral position.

**4,381,683**

## PEDAL FOR BICYCLE

**Nobumi Takeda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan**

**Division of Ser. No. 90,624, Nov. 2, 1979, Pat. No. 4,302,987.**
**This application Apr. 28, 1981, Ser. No. 258,441**
**Claims priority, application Japan, Nov. 11, 1978, 53-155525**
**Int. Cl.³ G05G *1/14***
**U.S. Cl. 74—594.6** **1 Claim**



1. A pedal for a bicycle comprising a pedal shaft, a pedal body supported on said pedal shaft, and a toe clip pivotally supported on the pedal body through a pivotal shaft means projecting from an underside of the pedal body, said pivotal shaft means extending in an inclined vertical direction such that a top end thereof is inclined rearwardly from a front of said pedal body with respect to a lower end thereof, the latter of which is positioned at said front of said pedal body, the pedal body being provided on its top face with a front treadle face and a rear treadle face and supporting through said pivotal shaft means the toe clip near the front treadle face, the toe clip being provided in its front portion with an upwardly rising shoe placing portion, said pivotal shaft means allowing the shoe placing portion to pivot to a first position where it is above the front and rear treadle faces of the pedal body and to a second position where it is below the front and rear treadle faces of said pedal body.

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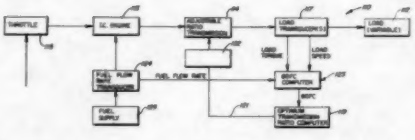
**4,381,684**

## ENERGY EFFICIENT DRIVE SYSTEM

**Sydney Himmelstein, Lake Bluff, Ill., assignor to S. Himmelstein and Company, Hoffman Estates, Ill.**

**Filed Nov. 5, 1979, Ser. No. 91,337**
**Int. Cl.³ F02B *77/00;* B60K *41/10***
**U.S. Cl. 74—862** **17 Claims**



1. In a drive system having a prime mover and a variable transmission, said drive system being responsive to variable load demand to provide a demanded load power with maximum input energy usage efficiency of the prime mover in producing said demanded load power, the improvement comprising:

means for continuously sensing the actual load power and determining the necessary adjustment of said variable transmission to cause the instantaneous brake specific energy consumption to be a minimum in providing the demanded output load power; and means continuously adjusting said variable transmission in accordance with the determined adjustment to obtain continuously minimum brake specific energy consumption operation of the prime mover for the demanded output load power; said determining means comprises means for determining sub-

stantially continuously whether the brake specific energy consumption is decreasing or increasing, and said adjusting means comprises means for continuing the mode of adjustment of the transmission in the event the brake specific energy consumption is determined to be decreasing and oppositely adjusting the transmission when the brake specific energy consumption is determined to be increasing.

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**4,381,685**

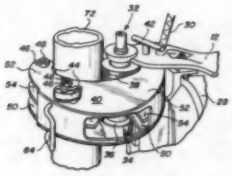
## PIPE JOINT MAKE-UP AND BREAK-OUT TOOL

**Marvin Q. Brooks, Box 179, Chickasha, Okla. 73018**

**Continuation-in-part of Ser. No. 170,749, Jul. 21, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,996**

**Int. Cl.³ B25B *17/00***

**U.S. Cl. 81—57.2** **5 Claims**



1. A pipe tool for making or breaking a pipe joint without latching of the tool around the pipe, which tool comprises:

a frame adapted to be positioned in proximity to the pipe, said frame including an aperture;

a rotating drum vertically mounted to said frame for engaging the pipe, said drum being mounted for rotation in first and second directions to thereby selectively rotate the pipe in first and second directions;

an arcuate pipe embracing member having first and second ends, said arcuate pipe embracing member being removably and reversibly pivotally mounted at said first end thereof to said frame for clamping the pipe aganist said rotating drum;

mounting means received by said frame aperture for mounting said arcuate pipe embracing member at said first end thereof to said frame, such that said arcuate pipe embracing member engages a first side of the pipe and pivots about said mounting means for rotating the pipe in a first direction while said drum rotates in said first direction;

said mounting means being removable to permit said arcuate pipe embracing member to be removed from said frame and reversed for mounting said first end thereof to said frame with said mounting means to allow said arcuate pipe embracing member to engage a second side of the pipe oppostie said first side of the pipe to thereby rotate the pipe in a second direction opposite said first direction while said drum rotates in said second direction;

first roller means mounted to said arcuate pipe embracing member second end for engaging the pipe at a position opposite said position of engagement with said drum; and

second roller means mounted to said arcuate pipe embracing member between said first and second ends thereof to engage the pipe and eliminating the need for means to clamp the arcuate pipe embracing member to the frame to oppose pivotal movement of the arcuate pipe embracing member when said drum is rotated.

**4,381,686**

## APPARATUS FOR CUTTING AND CONVEYING PLANAR WORKPIECES

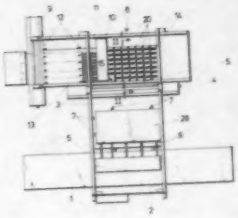
**Wilfried Ess, Schwarzach, Austria, assignor to Schelling & Co., Schwarzach, Austria**

**Filed May 19, 1981, Ser. No. 265,423**

**Claims priority, application Austria, May 21, 1980, 2724/80**

**Int. Cl.³ B23D *47/04*; B27B *5/06***

**U.S. Cl. 83—104** **9 Claims**



1. Apparatus for cutting and conveying planar workpieces comprising: a first and a second cutting saw arranged with cutting planes generally perpendicular to each other; first feeding means for feeding planar workpieces to be cut to said first saw, said first feeding means including means defining a generally horizontal support plane upon which said workpieces are supported during cutting by said first saw; and second feeding means for feeding cut workpieces from said first saw to said second saw, said second feeding means comprising roller means including a plurality of rows of rollers located adjacent each other and spaced apart for conveying said workpieces from said first saw to said second saw, said roller means being situated to define a roller support plane for said workpieces which is positioned lower than said horizontal support plane of said first feeding means, said horizontal support plane and said roller support plane being horizontally spaced apart to define a gap therebetween, grate means including a plurality of grate elements located between said rows of rollers and grate support means mounting said grate means for movement between said roller means and said first feeding means at least to the height of said horizontal support plane of said first feeding means and to bridge said gap.

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**4,381,687**

## CUTTING DEVICE FOR CUBING MEAT PRODUCTS

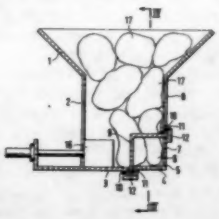
**Toni Reifenhäuser, Ritterstrasse 34, 5231 Burglahr, Fed. Rep. of Germany**

**Filed May 20, 1981, Ser. No. 265,686**

**Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020752**

**Int. Cl.³ B26D *3/18***

**U.S. Cl. 83—404.3** **4 Claims**



1. A device for cutting meat products into cubes, comprising an oblong, box-shaped magazine for receiving the material, a hopper to supply said magazine, a rough-pressing die associ-

ated with the magazine and extending over the length of the magazine and displaceable at right angles to the longitudinal axis of the magazine, frame knives arranged at an open end of the magazine, a press-out die conformed to the cross section of the magazine and displaceable against the meat product in the longitudinal direction of the magazine against said frame knives, an angular knife which is movable parallel to the press-out die into the magazine closing position, said knife having at least two arms, said magazine having a cavity defined on the bottom by a part of the bottom surface of said hopper, on the side opposite the rough-pressing die by a part of a side wall surface of said hopper and on the side facing the rough-pressing die as well as on the top side by lateral surfaces of the arms of said knife.

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**4,381,688**

## CUTTER FOR ROTARY CUTTING MACHINE

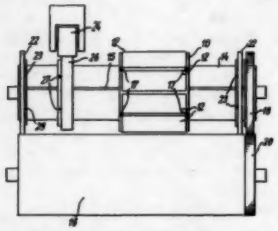
**Philip M. Hardy, Stockport, England, assignor to The Stampiton Group of Companies Limited, England**

**Continuation-in-part of Ser. No. 146,661, May 5, 1980, abandoned. This application Aug. 26, 1981, Ser. No. 296,465**

**Claims priority, application United Kingdom, May 24, 1979, 7918127**

**Int. Cl.³ B26D *3/08, 1/56;* B26F *1/42***

**U.S. Cl. 83—887** **12 Claims**



1. A rotary cutting machine comprising:

a main frame, a sub frame, bearing means on each of said frames, a rotatable cutter shaft journalled for rotation on the bearing means of the sub frame but removable therefrom, a hollow open ended cylinder having cutter blades on the outer surface thereof, the axial length of said cylinder being less than the axial length of the cutter shaft, said cylinder being removably mounted on said cutter shaft for rotation with said cutter shaft and further adapted for axial adjustment relative to the cutter shaft, an anvil roller journalled for rotation on the bearing means of the main frame and associated with said cutter shaft, distance piece means removably mounted on said cutter shaft and including a pair of distance pieces, each distance piece being removably mounted near an end of said cutter shaft for rotation therewith and bearing against the surface of said anvil roller to determine the distance between said cutter shaft and said anvil roller, gear means connected between said cutter shaft and said anvil roller, and means including an annular sleeve removably mounted intermediate a distance piece and an end of said cutter cylinder on said cutter shaft and rotatable therewith and a pressure roller bearing against said annular sleeve for urging the cutter shaft towards the anvil roller to maintain said cutter shaft and anvil roller in axially parallel spaced-apart relationship.

**4,381,689**

## CHORD GENERATING APPARATUS OF AN ELECTRONIC MUSICAL INSTRUMENT

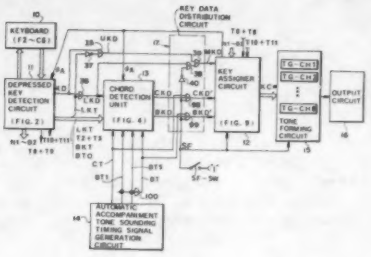
**Akiyoshi Oya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Oct. 21, 1981, Ser. No. 313,471**

**Claims priority, application Japan, Oct. 28, 1980, 55-150055**

**Int. Cl.³ G10H *1/38, 7/00***

**U.S. Cl. 84—1.01** **11 Claims**


KEY DATA DISTRIBUTION CIRCUIT
KEYBOARD (F2~C6)
DEPRESSED KEY DETECTION CIRCUIT (FIG. 2)
CHORD DETECTION UNIT (FIG. 4)
KEY ASSIGNER CIRCUIT (FIG. 9)
TONE FORMING CIRCUIT
OUTPUT CIRCUIT
AUTOMATIC ACCOMPANIMENT TONE SOUNDING TIMING SIGNAL GENERATION CIRCUIT

1. A chord generating apparatus of an electronic musical instrument comprising:

a plurality of keys;

a plurality of key switches provided for said plurality of keys respectively;

root note detecting means for selecting a single key among one or more of the depressed keys according to predetermined condition to detect the selected key as a root note designation key;

chord type detecting means for detecting a chord type according to the state of the depressed keys other than the selected root note designation key;

root note memory means for storing root note data which is rewritten in response to change in the root note designation key;

chord type memory means for storing chord type data detected by said chord type detecting means;

new key detecting means for detecting depression of a new key in response to the output of said key switches to provide a new key detection signal upon detection of the new key;

root note change detecting means for detecting change in a root note in response to the outputs of said root note detecting means and said root note memory means to provide a root note change signal during a waiting time in response to detection of the change in the root note;

control means for controlling loading of the chord type data to said chord type memory means in response to the outputs of said new key detecting means and said root note change detecting means; and

tone generating means for generating tones relating to a chord detection by the root note stored in said root note memory means and the chord type stored in said chord type memory means.

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**4,381,690**

## CYMBAL STAND

**Thomas E. Kimble, Covington, Ky., assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio**

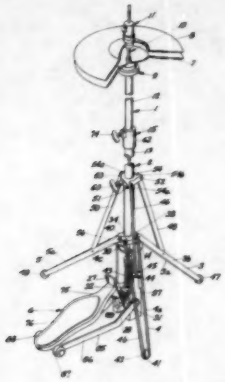
**Filed Mar. 2, 1981, Ser. No. 239,449**

**Int. Cl.³ G10G *5/00***

**U.S. Cl. 84—422 R** **18 Claims**

1. A cymbal stand for supporting a pair of upper and lower high-hat cymbals, said stand comprising a tubular assembly having upper and lower ends, a pedal frame affixed to the lower end of said tubular assembly and extending downwardly therefrom, a foot pedal having a forward end adjacent said pedal frame and a rearward end away from said pedal frame, a

pair of arms, said arms at one end thereof being pivotally affixed to opposite sides of said pedal frame, said arms at the other end thereof being pivotally affixed to opposite sides of said foot pedal toward said rearward end, an actuating rod extending vertically within said tubular assembly and having an upper end extending above said upper end of said tubular assembly and a lower end extending within said pedal frame, means to pivotally attach said forward end of said foot pedal to said lower end of said actuating rod, said pivotal attachment of said arms to said pedal frame and said forward end of said foot pedal to said actuating rod being coaxial, said foot pedal being



swingable beneath said pedal frame and said actuating rod between an operating position to one side of said pedal frame and a stowed position along the other side of said pedal frame and said tubular assembly, means to support said lower cymbal on the upper end of said tubular assembly, means to support said upper cymbal on said upper end of said actuating rod, said upper cymbal being movable by said foot pedal and actuating rod between a first upper position above said lower cymbal, and a second lower position in contact with said lower cymbal, and adjustable means to bias said upper cymbal, actuating rod and foot pedal to said first position.

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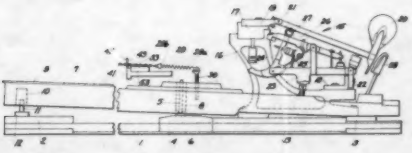
**4,381,691**

**TOUCH FORCE ADJUSTMENT MEANS FOR A PIANO**

**Harold A. Conklin, Jr., and Pieter W. van Nuis, both of Hamilton County, Ohio, assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio**

**Filed Jan. 9, 1981, Ser. No. 223,756**
**Int. Cl.³ G10C *3/12***
**U.S. Cl. 84—440** **17 Claims**



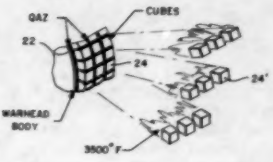
1. A touch force adjustment means for a piano playing key of the type adapted to operate a hammer action, said touch force adjustment means comprising a spring member means, said spring member means being connected to said key and being connected to a means located above said key, one at least of said connections being adjustable said spring member means being prestressed in tension by means of said adjustable connection to reduce said touch force of said key.

**4,381,692**

**METHOD OF MAKING AN INCENDIARY MUNITION**

**Herbert S. Weintraub, Atherton, Calif., assignor to Quantic Industries, Inc., San Carlos, Calif.**

**Continuation of Ser. No. 795,935, May 11, 1977, abandoned, Continuation-in-part of Ser. No. 704,541, Jul. 12, 1976, abandoned. This application Jun. 15, 1981, Ser. No. 273,327**
**Int. Cl.³ F42B *13/14***
**U.S. Cl. 86—20 B** **10 Claims**




1. A method of making a munition with a flowable incendiary material comprising a mixture of epoxy and powdered metal including the following steps: cleaning a surface of the munition; and solidifying and bonding said incendiary material to said surface by the use of sufficient heat and pressure such material being bondable by said heat and pressure to said surface to maintain structural integrity between said munition surface and said incendiary material to prevent the separation of said material from said surface during the occurrence of setback during firing of the munition.

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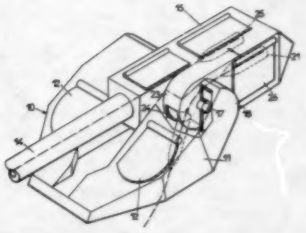
**4,381,693**

**MILITARY EQUIPMENT COMPRISING A TURRET CARRYING AN EXTERNAL LARGE CALIBER GUN**

**Raoul H. Dumez, Sainte Adresse, France, assignor to Hispano-Suiza, Saint Cloud, France**

**Filed Jul. 22, 1980, Ser. No. 171,100**
**Claims priority, application France, Jul. 27, 1979, 79 19401**
**Int. Cl.³ F41F *23/06***
**U.S. Cl. 89—36 K** **11 Claims**



1. Military equipment comprising: a turret mounted on a mount for rotation about a substantially vertical axis; a pair of side members secured to said turret and projecting upwardly therefrom; bearing means carried by said side members and defining an elevation axis transverse to said vertical axis; a main gun of a caliber greater than that suitable for belt feed of ammunition and located out of and above said turret, carried by said bearing means and provided with a separate shield unitarily connected to said gun, said bearing means cooperating with the shield of the gun to define a protected passage; and a gun loading system, at least a portion of which is located in said protected passage, arranged to carry one round of ammunition at a time from a predetermined location inside the turret and to insert said round into a firing chamber of said gun, said loading system being arranged to accommodate the variations in elevation, the shield of said gun including a front wall located

on one side of the gun in which there is provided an opening for said loading system whose angular extent is sufficient to allow loading in the whole range of elevation aiming of the gun.

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**4,381,694**

**RECOIL BLOCK OR BRAKE FOR A LINEAR BREECH MECHANISM IN AN AUTOMATIC FIRE ARM**

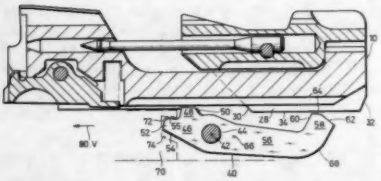
**Clemens Bremer, Duesseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany**

**Filed Mar. 11, 1981, Ser. No. 242,670**

**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009225**

**Int. Cl.³ F41D *11/06***

**U.S. Cl. 89—190** **1 Claim**



1. In an automatic firearm, a recoil brake mechanism for a breech block, which is linearly reciprocally mounted in the housing of the firearm said breech block having a slide reciprocally slidably mounted thereon which reciprocates parallelly with respect to said breech block along a predetermined path between a forward blocking position and a rear inoperative position, comprising

(a) a two-armed lever pivotally mounted in said housing and adapted to coact with said slide;

(b) said two-armed lever having a first control surface which is selectively pivoted into the path of movement of said slide;

(c) said slide having front and rear contacting surfaces, disposed at predetermined distances from each other along said predetermined path;

(d) said front and rear contacting surfaces being inclined at predetermined angles with respect to said predetermined path of movement;

(e) said first control surface of said two-armed lever being disposed on a first arm of said two-armed lever;

(f) the center of gravity of said lever being disposed on a second arm of said two-armed lever at a distance from the pivotal axis of its pivotal mounting;

(g) said second arm having a second control surface which is inclined with respect to said predetermined path is selectively pivoted into said path, said center of gravity of said lever being disposed between said second control surface and said pivotal axis;

(h) said first control surface and front contacting surface being adapted to make contact with each other;

(i) said second control surface being disposed in said predetermined path of said slide when it is in its blocking position and said second control surface being adapted to coact with said rear contacting surface of said slide; and

(j) said two-armed lever being pivotally mounted over a predetermined angular range.

**4,381,695**

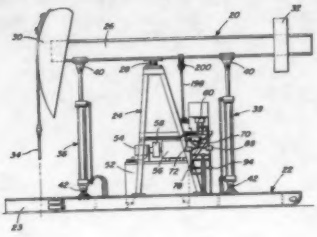
**HYDRAULICALLY OPERATED PUMP JACK WITH HOLDING VALVES AND CONTROL ASSEMBLY**

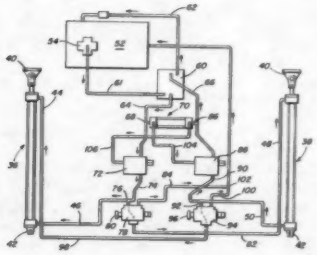
**Ethridge F. Ogles, Ada, Okla., assignor to Wink H. Kopcynski, Ada, Okla.**

**Filed Aug. 1, 1980, Ser. No. 174,589**

**Int. Cl.³ F01L *31/00, 15/00***

**U.S. Cl. 91—178** **14 Claims**





1. In a pump jack having a beam supported for pivotal movement about a generally horizontal transverse axis and means at one end of said beam for connection with a pump rod, a pair of hydraulic fluid pressure operated piston and cylinder assemblies connected to said beam for powering the beam about its pivot axis, each of said piston and cylinder assemblies being powered from a hydraulic pump having a separate conduit connected to each end of the cylinders, a reversing valve communicating the pump with the conduits, means interconnecting the reversing valve and the beam for controlling the position of the reversing valve in response to movement of the beam, and means controlling flow in each of the conduits between the reversing valve and the piston and cylinder assemblies for providing positive control of the movement of the beam throughout its cycle of movement, said flow control means including valve means in each conduit enabling flow toward the piston and cylinder assemblies and preventing return flow, and means responsive to flow in one conduit toward the piston and cylinder assembly to open the valve means in the other conduit to enable return flow.

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**4,381,696**

**MICROWAVE COFFEE MAKING APPARATUS**

**Joseph R. Koral, Manitowoc, Wis., assignor to Mirro Corporation, Manitowoc, Wis.**

**Filed Apr. 27, 1981, Ser. No. 257,629**

**Int. Cl.³ A47J *31/00*; H05B *6/64***

**U.S. Cl. 99—304** **11 Claims**

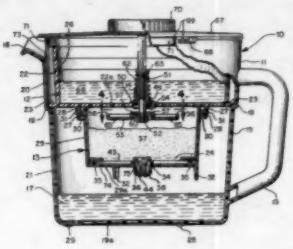
1. An apparatus for making coffee through the use of microwave energy, comprising:

a water reservoir with at least one aperture near the bottom thereof;

a coffee grounds basket having at least one drain hole therein

and positioned to receive water from said water reservoir through said aperture;

a pitcher positioned to receive brewed coffee from said drain hole in said coffee grounds basket;



a cover removably mounted over said water reservoir; and valve means for controlling the flow of water through said aperture, said valve means being opened by said cover when said cover is mounted over said water reservoir.

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**4,381,697**

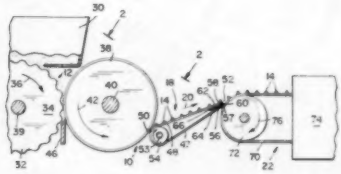
## APPARATUS TO MAKE COOKIES

**William G. Crothers, Princeton, N.J., assignor to Deer Park Baking Co., Hammonton, N.J.**

**Filed Jan. 26, 1981, Ser. No. 228,292**

**Int. Cl.³ A47J *37/00*; A21B *3/07***

**U.S. Cl. 99—353** **10 Claims**



1. An improved apparatus to make cookies comprising;

a. dough bit shaping means having a first surface being formed with cavities recessed from said first surface for forming dough into individual dough bits, said dough bit shaping means being formed with a second surface disposed in a plane other than said first surface so as to form elements, which elements are disposed adjacent said cavities;

b. transfer conveyor means being disposed adjacent said dough bit shaping means and having a transfer surface extending between a first location and a second location, said elements and said transfer surface being in contact so that said elements engage said transfer surface so that said dough bits are received from said dough bit shaping means onto said transfer surface and transferred to said second location where said dough bits are removed from said transfer surface; and

c. oven means for receiving said dough bits from said transfer conveyor so as to bake said dough bits to make said cookies.

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**4,381,698**

## CHANGEOVER VALVE UNIT FOR POWER-ASSISTED STEERING SYSTEMS

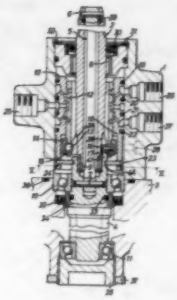
**Akira Hasegawa; Yoshimi Sato, both of Susono; Masahisa Ando, Aichi, and Nobuo Hiraiwa, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Dec. 16, 1980, Ser. No. 217,171**

**Claims priority, application Japan, Dec. 28, 1979, 54-170605**

**Int. Cl.³ F15B *9/10***

**U.S. Cl. 91—382** **4 Claims**



1. A changeover valve unit for a power-assisted steering system including a driven member for operative connection with the steering road wheels of a wheeled vehicle and arranged to be power-assisted by a hydraulic cylinder, said changeover valve unit comprising:

a valve housing provided with an inlet port for connection to a source of fluid pressure, outlet ports for connection to said hydraulic cylinder, and a drain port for connection to a fluid reservoir;

input and output shafts arranged for relative rotation on aligned axes within said valve housing, said output shaft being operatively connected to said driven member;

a resilient member interconnecting said input and output shafts for permitting relative rotation of said shafts;

a spool valve element arranged to be moved in response to relative rotation of said shafts in an axial direction;

a valve casing in surrounding relationship with said spool valve element within said valve housing and cooperating with said spool valve element for controlling the flow of fluid among said ports; and

means for conducting axial movement of said spool valve element in response to relative rotation of said shafts;

the improvement wherein a thrust plate is rotatably coupled at its inner periphery with said output shaft to freely permit rotation of said output shaft relative to said valve casing and is secured at its outer periphery to said valve casing, to permit axial movement of said valve casing in said valve housing caused by axial displacement of said output shaft.

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**4,381,699**

## HYDRAULIC CONTROL SYSTEM

**Hubert Häussler, Neubeim/Zug, Switzerland, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany**

**Division of Ser. No. 864,652, Dec. 27, 1977, Pat. No. 4,205,592. This application Mar. 20, 1980, Ser. No. 132,151**

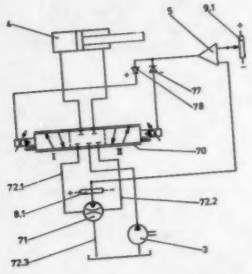
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658928**

**Int. Cl.³ F15B *13/044***

**U.S. Cl. 91—433** **7 Claims**

1. In a hydraulic system including a hydraulic drive unit for moving a load, said drive unit being connected to a hydraulic circuit through which hydraulic fluid flows from and back to

a fluid reservoir via a pressure fluid supply means under the control of flow-control valve means having a main control plunger, an electrically operated means to position said main control plunger, a flow meter having a displaceable measuring element to sense the flow of said hydraulic fluid, an electric displacement measuring means connected to the flow meter so as to detect the displacement amplitude of said measuring element and to convert said amplitude of said measuring element into an electric actual-value signal proportional to the existing fluid flow, means for sending an adjustable electric desired-value signal, electric comparing means to compare an input of said actual-value signal with an input of said desired-value signal in order to provide an output difference signal and means connecting the output of said electric comparing means to said electrically operated positioning means in order to position the main control plunger of said flow-control valve means in response to the difference signal,



the improvement for regulating and maintaining a substantially constant velocity of movement of said hydraulic drive unit, irrespective of disturbances including fluctuations in the pressure of the fluid supply, which comprises:

a flow meter arranged in said hydraulic circuit, said flow meter having a housing of constant inner diameter which encloses at least one pressure chamber around a longitudinal flow axis with radially disposed and axially displaced inlet ports and an outlet port to conduct the hydraulic fluid therethrough; and

a measuring element of said flow meter having sensor means which are axially movable in said housing between said biased spring means such that said sensor means, in the rest position, cover a radially disposed outlet port while the inlet ports are disposed outside the range of movement of said sensor means on either side of said outlet port.

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**4,381,700**

## STEPLESS INFINITE VARIABLE SPEED MOTOR

**Leonard L. Lenz, 811 SE. 10th St., Okeechobee, Fla. 33472**

**Filed Sep. 2, 1980, Ser. No. 182,851**
**Int. Cl.³ F01B *13/06***
**U.S. Cl. 91—497** **25 Claims**

1. A fluid actuated device for providing a variable torque-variable speed drive to a shaft, said device comprising

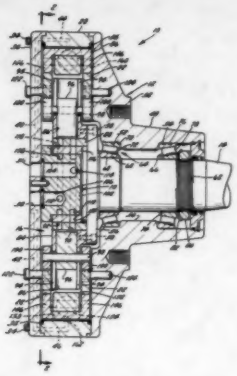
a casing,

a shaft mounted for rotary motion in said casing,

a fluid actuated radial piston drive assembly secured to said shaft and disposed within said casing, said drive assembly including a plurality of pistons to rotate said drive assembly,

valve means mounted on said casing for regulating the flow of fluid to said pistons in said drive assembly, and

cam means disposed in said casing radially outward from said drive assembly, said cam means including a plurality of variable cam surfaces defining a number of cycles of



motion for said pistons whereby the torque and speed of rotation of said drive assembly can be varied.

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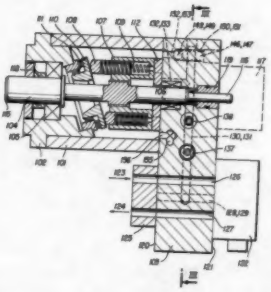
**4,381,701**

## SERVOMOTOR FEATURING A SERVOVALVE CONTROLLING A HYDRAULIC DRUM MOTOR

**Roger Maistrelli, Bougival, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France**

**Filed Sep. 5, 1980, Ser. No. 184,267**
**Claims priority, application France, Sep. 6, 1979, 79 22329**
**Int. Cl.³ F16D *31/02*; F01B *13/04***
**U.S. Cl. 91—499** **3 Claims**



1. A servomotor comprising:

a housing having an axis;

a cover on one axial end of said housing;

a substantially parallelopiped enclosing plate on the other axial end of said housing;

cylinder head means in said housing and having a surface inclined to said axis;

a motor shaft journalled in said cover and said enclosing plate;

a drum rotating on said motor shaft and including two pistons slidable in said drum and biased against said surface of said cylinder head;

a distribution port in said enclosing plate for each said piston;

a servovalve having supply and use openings on a first surface thereof, said first surface being in fixed fluid tight contact with one surface of said enclosing plate;

first axial bore means in said cover plate for each said piston,

each said first bore means communicating with each said distribution port;

second axial bore means in said cover plate for each said first axial bore means, each said second bore means having one end extending to said one surface of said enclosing plate for communicating with said use openings of said servovalve;

third bore means extending perpendicular to said first and second bore means and communicating each said first bore means with a corresponding second bore means;

two transverse bore means connecting each of said third bore means;

two way safety valve means in said at least one transverse bore, wherein said enclosing plate further comprises two fourth bore means having one end extending to said one surface of said enclosing plate for communicating said servovalve supply openings with two outside connection channels joined respectively to a high pressure source and a non-zero low pressure source, said connection being effected by means of a connection block applied onto a second surface of said plate, the other end of said fourth bore means extending to said second surface of said plate.

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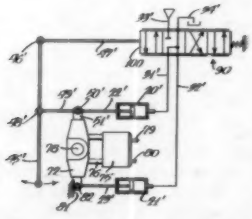
**4,381,702**

## DISPLACEMENT CONTROL FOR A HYDRAULIC PUMP OR MOTOR WITH FAILURE OVERRIDE

**H. Allen Myers, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.**

**Filed Nov. 21, 1980, Ser. No. 209,069**
**Int. Cl.³ F01B *13/04*; F04B *1/22***
**U.S. Cl. 91—506** **19 Claims**



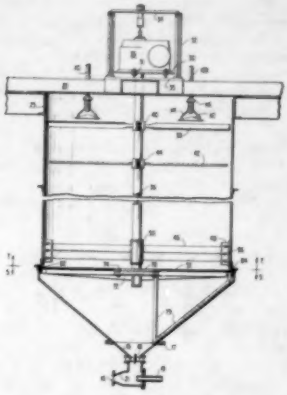
1. A displacement control for a variable displacement fluid translating device having a movable member for controlling displacement, a circuit including a control device operatively connected to said movable member and a control valve having connections to a source of pressure and a drain for hydraulically operating said control device, means hydraulically connecting the control valve and control device, said control valve having a neutral position wherein said movable member is at or close to a neutral position and at least one other position wherein said movable member is in a displacement-setting position, position-controlling means for setting the position of the control valve, said control valve having a control position not used in normal positioning of the movable member, means operative in response to an operative failure of said position-controlling means for moving the control valve to said control position, and said control valve having means at said control position to establish communication of said control device to one or the other of said connections which enables the movable member to move to a position which minimizes any adverse effects from said failure.

**4,381,703**

## VERTICAL SOAK TANK WITH IMPROVED LEVELLING AND WEIGHING APPARATUS

**Darrell B. Crimmins, Carrollton, and George H. Steinmetz, Dallas, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.**

**Filed Feb. 12, 1982, Ser. No. 348,162**
**Int. Cl.³ B02H *1/04***
**U.S. Cl. 99—516** **15 Claims**



1. A vertical soak tank apparatus for contacting solids and liquids while slowly and continuously moving the solids vertically by gravity plug flow through the tank, the tank including, a central vertical drive shaft extending downward, a rotatable horizontal disc driven by the drive shaft and supported adjacent to the bottom of the vertical tank means, an emptying slot in the disc for emptying materials supported on the disc as the disc rotates in a controlled manner, and improved means for adding solids and liquids to the tank and assuring continuous plug flow, comprising; at least one downwardly extending inlet pipe with a deflector spaced below the exit to the inlet pipe adjacent the top portion of the tank so that material entering the inlet pipe is spread by the deflector evenly over the surface of material already in the tank, solids levelling means attached to the drive shaft, at a level below the deflector, below a normal liquid level in the tank, and not above the normal top level of the solids in the tank.

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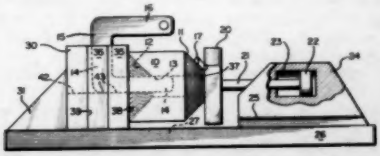
**4,381,704**

## METHOD AND APPARATUS FOR REMOVING IRREGULAR LAP FORMATIONS IN COILS OF METAL STRIP

**Raymond J. Lepp, Flossmoor, Ill., assignor to Inland Steel Company, Chicago, Ill.**

**Filed Apr. 15, 1981, Ser. No. 254,482**
**Int. Cl.³ B30B *13/00***
**U.S. Cl. 100—35** **13 Claims**



1. A method for straightening irregular lap formations in a coil of metallic strip material wherein, on each side of the coil, the edges of at least some laps extend in an axial direction a

distance different than the edges of other laps, there being no axial spaces in said coil, said method comprising the steps of:

placing said coil between a pair of spaced-apart members each located on a respective opposite side of the coil;

engaging one of said members with the most outwardly extending lap edge on one side of the coil, around the entire periphery of the lap, and engaging the other of said members with the most outwardly extending lap edge on the other side of the coil;

moving one of said members toward the other member to decrease the distance therebetween and to eliminate the differences in the distances to which said lap edges extend on each side of the coil in response to said movement of said member;

supporting said coil along its axis in a manner which permits movement of said laps in an axial direction during movement of said member;

and vertically withdrawing said supported coil, at the conclusion of said straightening operation, without initially employing a substantial relative displacement in an axial direction between said supported coil and said other member.

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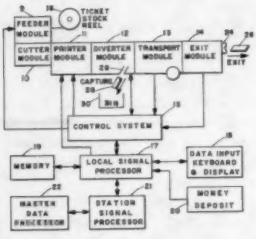
**4,381,705**

**MODULARIZED TICKET HANDLING SYSTEM FOR USE IN AUTOMATIC TICKET PREPARATION SYSTEM**

**John B. Roes, San Diego; Guy M. Kelly, La Jolla; Robert F. Case, and Chandler R. Deming, both of San Diego, all of Calif., assignors to Cubic Western Data, San Diego, Calif.**

**Filed Dec. 1, 1980, Ser. No. 211,022**
**Int. Cl.³ B41K *3/68, 5/00*; B41L *45/12***
**U.S. Cl. 101—69** **10 Claims**




1. A ticket handling system for use in a ticket preparation system that includes processing means for providing print signals to indicate information to be printed on said tickets and write signals to indicate information to be encoded on said tickets; printing means for printing information on ticket stock in response to said print signals; first transducer means for encoding information on said ticket stock in response to said write signals, second transducer means for reading said encoded ticket and for providing a read signal in response thereto; circuit means for comparing said read signal to said write signal and for providing a verification signal in response to said comparison; and processing means for processing the verification signal and for providing control signals subsequent thereto to indicate whether the ticket is to be passed to an exit position where said ticket is accessible to a patron or to a capture position where said ticket is inaccessible to said patron;

the ticket handling system comprising

a feeder module including feed means for feeding a strip of ticket stock;

a cutter module including cutting means for cutting ticket blanks of a given length from the fed end of the strip;

a printer module including the printing means for printing ticket information on the ticket blanks in response to said print signals; and

a transport module mechanically interfaced with the printer module and including the first transducer means for encoding ticket information on the ticket blanks in response to said write signals, and the second transducer means for reading said encoded ticket and for providing said read signal in response thereto; and

a diverter module mechanically interfaced with the transport module and including means defining a capture passage for passing said ticket from the transport module to said capture position where said ticket is inaccessible to said patron, means defining an exit passage for passing said ticket from the transport module to said exit position where said ticket is accessible to said patron, and sensing means for sensing the passage of said ticket through the exit passage; and

wherein the ticket handling system includes control means coupled to the sensing means and the feeder module feed means for enabling the feed means to feed said strip of ticket stock in response to the sensing means sensing the passage of said ticket through the exit passage.

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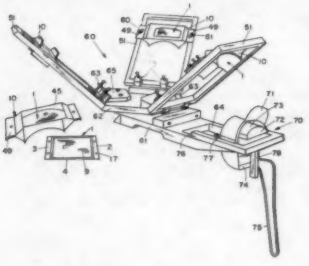
**4,381,706**

**PRINTING SCREEN AND METHOD**

**Charles W. Harpold, 405 Douglas, NW., Grand Rapids, Mich. 49504**

**Filed Mar. 18, 1981, Ser. No. 245,046**
**Int. Cl.³ B05C *17/06, 17/08***
**U.S. Cl. 101—127.1** **19 Claims**



1. A method for making screens to print arcuately shaped articles and the like, comprising the steps of:

providing a printing frame having substantially rigid end segments, and resilient, semi-rigid side segments connected therewith to define a plane with a frame perimeter; said frame being adapted to be flexed along said frame side segments in a direction generally transverse to the plane of said frame into an arcuate configuration which is complementary with the shape of the article to be printed;

deflecting said frame side segments at medial portions thereof laterally toward each other a predetermined distance, and temporarily retaining the same in the deflected condition;

providing a panel of screen material shaped for attachment to the perimeter of said frame, and adapted for carrying a pattern to print onto the article;

tensing said screen panel into a generally, uniformly taut condition;

attaching the taut screen panel to the perimeter of said frame, with said frame side segments in the laterally deflected condition, and said frame positioned in a substantially flat condition;

releasing said frame side segments, thereby laterally stressing said screen panel;

forming a pattern on the lateral stressed screen panel with said screen panel in a substantially flat condition; and

flexing said screen in a direction generally transverse to the plane of said frame into an arcuate configuration which is complementary with the shape of the article to be printed,

whereby when said screen is flexed into the desired arcuate configuration for printing, said pattern is not distorted.

10. A kit for making screens to print arcuate articles and the like, comprising:

a printing frame having substantially rigid end segments, and resilient, semi-rigid side segments connected therewith to define a plane with a frame perimeter; said frame side segments have outer edges spaced apart a predetermined distance; said frame being adapted to be flexed along said frame side segments in a direction generally transverse to the plane of said frame into an arcuate configuration which mates with the shape of the article to be printed;

a panel of screen material adapted for attachment to said frame and for carrying a pattern thereon;

said frame having first and second functional configurations, said first configuration being substantially flat with medial portions of said side segments being laterally deflected toward each other a predetermined distance for attaching said panel of elastic screen material to said frame, and said second printing configuration being an arcuate configuration wherein said side segments are flexed in a direction generally transverse to the plane of the frame and corresponds with the shape of the article to be printed;

an assembly jig shaped to receive said frame thereon, and having a pair of upstanding stops anchored therein; said stops having interior sides and being spaced apart a distance slightly less than the distance between the outer edges of said frame side segments, and allowing for the deflection of the medial portions of said frame side segments inwardly a predetermined distance when said frame is received on said jig; said jig having printing frame retaining means for retaining said frame thereon with said frame side segments in a deflected configuration;

a tensing frame having a perimeter larger than the perimeter of said printing frame, and means for retaining said screen panel therein in a generally, uniformly taut condition, whereby the kit allows for the attaching of said taut screen panel to said printing frame in the deflected condition to laterally stress said screen panel when released from said assembly jig, forming a pattern on the laterally stressed screen panel with said screen panel in a substantially flat condition; and thereby distortion of said pattern is alleviated when said printing frame is flexed into said arcuate printing configuration;

a rigid screen holder having end plates with detachable connecting means for detachably connecting said printing frame end segments therewith, and being mutually inclined for bending said frame into and maintaining said frame in the desired printing configuration.

16. An assembly jig for making printing screens of the type having a frame with a perimeter which includes substantially rigid end segments and resilient, spaced side segments, and a screen panel mounted in the frame; said assembly jig comprising:

a base shaped to receive the printing screen frame thereon;

first and second studs anchored in and upstanding from a medial portion of said base; said studs having interior sides and being substantially rigid and spaced laterally apart a distance slightly less than the spacing between the outer edges of said frame side segments, whereby said frame side segments are deflected inwardly at a medial portion thereof when inserted between said studs;

serrations on the interior sides of said studs for retaining the printing frame between said studs; and

said studs having pointed free ends oriented to pierce the screen panel when the screen panel is placed in contact with said studs.

**4,381,707**

## MECHANISM FOR LIFTING AND LOWERING AN IMPRESSION CYLINDER WITH SPRING-BIASED MULTIPLE DISC BRAKE LOCKING DEVICE

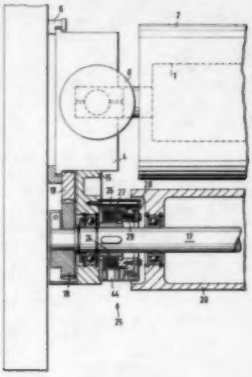
**Peter Klaus, Tecklenburg, and Jürgen Westerkamp, Lengerich, both of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany**

**Filed Dec. 10, 1981, Ser. No. 329,327**

**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046989**

**Int. Cl.³ B41F *3/58***

**U.S. Cl. 101—282** **7 Claims**



1. Apparatus for applying and withdrawing pressure and, as is necessary for cylinder replacement, causing a wide stroke to be executed by an impression cylinder which acts on the plate cylinder of a rotogravure press and of which the two journal bearings are each connected to a double acting pressure cylinder for lifting and lowering the impression cylinder and are interconnected by a synchronising shaft which is mounted thereon and is provided with pinions engaging racks fixed with respect to the frame, characterised in that the synchronising shaft (17) can, for the purpose of blocking, be coupled to the journal bearings (4, 5) by at least one spring-biassed multiple disc brake (25), and that the brake (25) is released during execution of the wide stroke and during pressure application of the impression cylinder (1) and is actuatable for engagement at the end of the short-stroke pressure withdrawal.

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**4,381,708**

## DUCTOR BLADE ADJUSTING DEVICE FOR PRINTING MACHINES, IN PARTICULAR FOR WEB-FED PRINTING MACHINES

**Dieter Hirt, Auerbergweg 10; Zdravko Krovinovic, Brücken Str. 16 A, both of 8900 Augsburg, and Rupert Schmitt, 8901, Holzhausen Nr. 51 1/4, all of Fed. Rep. of Germany**

**Filed Sep. 3, 1980, Ser. No. 183,761**

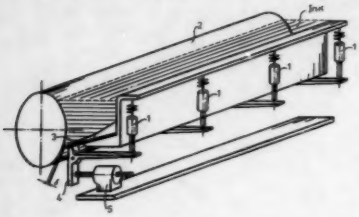
**Claims priority, application Fed. Rep. of Germany, Sep. 3, 1979, 2935489**

**Int. Cl.³ B41F *31/02***

**U.S. Cl. 101—365** **2 Claims**

1. A doctor blade adjusting device for a printing machine comprising an inking roller, a doctor blade facing said inking roller and adapted to be spaced therefrom by a gap to establish a predetermined ink thickness on the inking roller, a plurality of sensor means operatively associated with said inking roller and doctor blade for determining the spacing between the inking roller and the doctor blade, servomotor means operatively coupled to said doctor blade for adjusting the size of said gap, and microcomputer means connected to said plurality of sensor means and said servomotor means for receiving input signals from said sensor means (1) for calculating the desired

distance between the inking roller and the doctor blade according to given values of ink thickness (2) for comparing this desired distance with the actual distance and (3) for sending signals to said servomotor means to adjust the doctor blade so that the actual distance and the desired distance correspond, said microcomputer means also receiving (a) the distances determined by the individual sensor means in an initial non-



adjusted state when the inking roller is touching the doctor blade and establishing this as the zero position of the doctor blade and (b) the distances determined by the individual sensor means in an adjusted position of the blade, said microcomputer means evaluating respective sensitivities of the individual sensor means on the basis of the distances from (a) and (b) and supplying said sensitivities for utilization in the setting of the doctor blade to the desired adjusted position.

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**4,381,709**

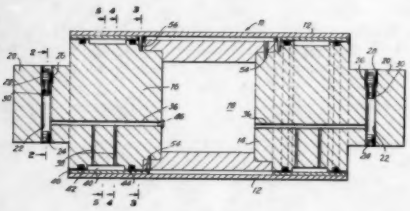
**PRINTING ROLLER WITH REMOVABLE CYLINDER**

**Robert Katz, 78 W. 11th St., New York, N.Y. 10011**

**Filed Jun. 13, 1980, Ser. No. 159,158**

**Int. Cl.³ B41F** *13/10, 13/20*

**U.S. Cl. 101—375** **4 Claims**



1. A printing roller assembly including a tubular printing cylinder and a mandrel on which said printing cylinder is removably supported, said mandrel including:

dual axially-spaced journal members, each having an outer cylindrical portion received within an end portion of the bore of said tubular printing cylinder;

a concentric cylindrical boss at one end of each said journal member;

a hollow, relatively light-weight cylindrical member having an outside diameter substantially the same as the outside diameter of each said cylindrical portion of each said journal member, and which is fixedly attached to said cylindrical end bosses of the respective journal members;

locating members extending radially through said cylindrical member at positions spaced circumferentially of each end thereof and secured within the associated bosses of said journal members;

said cylindrical member supporting said journal members in axial alignment with each other, and said locating members locating said bosses and said cylindrical member against rotational movement relatively to each other, the combined axial length of said cylindrical member and said bosses being substantially equal to the axial length of said printing cylinder;

said journal members each including dual, continuous, axially-spaced grooves in the outer periphery thereof and a continuous circumferential recess intermediate said grooves;

an imperforate radially-expandable metal sleeve loosely positioned on each journal member, each said sleeve having an axial length greater than the distance between the axially remote walls of said grooves in the associated journal member, each said sleeve having an internal diameter only slightly greater than the outer diameter of the associated journal member;

locating members extending radially through each said sleeve at positions spaced circumferentially thereof and secured in the associated journal member, said locating members inhibiting relative rotational and axial movement between each said sleeve and the associated journal member;

a sealing member located within each groove, each sealing member being held under compression by the associated sleeve and acting to center the associated sleeve on the associated journal member;

means positioned in each said groove and located between each said sealing member and the said remote wall of the associated groove adapted to inhibit axial extrusion of said sealing member under the influence of hydraulic fluid under pressure supplied to the circumferential recess intermediate said grooves;

said printing cylinder being positioned over said mandrel and overlying at least a portion of each said sleeve; and

hydraulic pressure supply means incorporated into each said journal member are connected by internal conduits to the associated circumferential recess thereof, said supply means including a cylinder for hydraulic fluid, a piston closing the cylinder and movable into the cylinder, and means for moving said piston into said cylinder;

said hydraulic supply means being located within a member on at least one of said journal members and adapted for the support and driving of said mandrel and said printing cylinder carried thereby, said hydraulic pressure supply means being operative to exert pressure and to expand said sleeves into supporting and driving engagement with the inner periphery of said printing cylinder.

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**4,381,710**

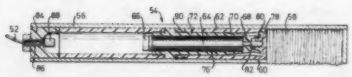
**MOISTURE ACTUATED TRIGGER DEVICE**

**Paul G. Wätterbäck, Flen, Sweden, assignor to AB Sibe International, Spanga, Sweden**

**Division of Ser. No. 185,927, Sep. 10, 1980. This application Oct. 2, 1980, Ser. No. 193,108**

**Int. Cl.³ F42C** *19/00*

**U.S. Cl. 102—200** **5 Claims**



1. A moisture actuated trigger device comprising a housing; a moisture absorbing swelling body inserted through an opening in said housing, one end of said body engaging a stationary wall member of said housing and the opposite end engaging an end wall of a sleeve slidable within said housing upon expansion of the swelling body; an elongated plunger member in said housing movable between a first, stand-by position and a second, released position; latch means detachably engaging said plunger member for holding it in its first, stand-by position; spring means biasing said plunger member in a direction towards its released position; cam means on said sleeve for disengaging the latch means from the plunger member thereby

enabling the latter to rapidly move from its first, stand-by position to its second, released position; and a shock wave initiating means located in the path of travel of said plunger member.

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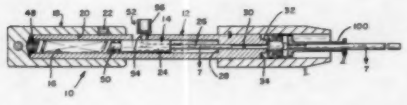
**4,381,711**

## HAND-HELD SHOT TUBE DETONATOR

**Howard Lawrence, Sunbury, Pa., assignor to E.I.T. Corporation, Sunbury, Pa.**

**Filed Oct. 14, 1980, Ser. No. 196,922**
**Int. Cl.³ F42B *3/10***
**U.S. Cl. 102—275.11** **33 Claims**



**1.** A detonator of the type including a firing pin body with a firing pin, a spring biasing the firing pin toward a firing position, and a trigger operable to release the firing pin for movement to the firing position, wherein the improvement comprises a holder separate from the body having a cap bore for receiving an explosive primer, at least one vent passage in the holder intersecting the cap bore, a hollow neck extending away from the cap bore adapted to surround the upstream end of a shot tube or the like, the interior of the neck communicating with the primer bore; and means for removably mounting the holder on the firing pin body with the bore at the firing position, said means including abutting surfaces on said body and holder preventing movement of the holder away from the firing position when the primer is fired whereby the shock wave and blast expand from the primer bore into and along the interior of the neck to ignite the shot tube and are vented through the passage.

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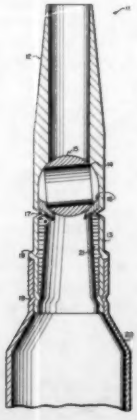
**4,381,712**

## BALL-ACTUATED TUBULAR PROJECTILE

**William L. Black, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 10, 1981, Ser. No. 252,738**
**Int. Cl.³ F42B *11/00***
**U.S. Cl. 102—503** **21 Claims**



**1.** A tubular projectile having an axial bore, comprising:

a body having;

a tail portion having walls defining said axial bore;

a nose portion having relatively thick walls with respect to the walls of said tail portion;

a valve seat formed in said nose portion in said thick walls;

an apertured spherical ball supported on said valve seat for rotation thereon;

a washer contacting said spherical ball valve in opposing relationship to said valve seat; and

a cannelure in the walls of said tail portion adjacent said washer for holding said ball valve in a predetermined position and for providing a seal therefor.

**9.** A method of making a projectile comprising:

forming a tubular body having a thick walled nose portion adjoining a thin walled tail portion;

shaping said thick walls at the junction of said nose and tail portions to form a spherically surfaced valve seat;

placing an apertured spherical valve on said valve seat in a predetermined position;

inserting a resilient washer in said tail portion to rest on said spherical valve; and

producing a cannelure in said thin walled tail portion to reduce the axial bore thereof at a position adjacent said washer to compress said washer so as to secure said valve in said predetermined position.

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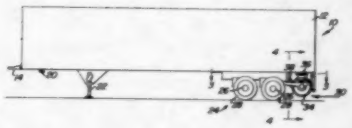
**4,381,713**

## CONVERTIBLE RAIL-HIGHWAY SEMI-TRAILER AIR CONTROLLED BRAKING AND SUSPENSION SHIFTING SYSTEM

**Christopher A. Cripe, Coatesville, Pa., assignor to Bi-Modal Corporation, Greenwich, Conn.**

**Continuation-in-part of Ser. No. 145,748, May 1, 1980, Pat. No. 4,316,418. This application Sep. 25, 1981, Ser. No. 305,443**
**The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.**
**Int. Cl.³ B60F *1/04*; B61D *3/10*; B61H *1/00*; B62D *61/12***
**U.S. Cl. 105—215 C** **9 Claims**



**1.** In a vehicle convertible from highway to railroad mode of travel and vice versa; including a body, a rail wheel-set axle unit, air spring means supporting said body on said rail wheel-set axle unit, a highway wheel-set axle unit, air spring means supporting said body on said highway wheel-set axle unit, means interconnecting said body and said rail wheel-set axle unit operative to lift and retain said rail wheel-set axle unit in its elevated stored inoperative position in the highway mode, and means interconnecting said body and said highway wheel-set axle unit operative to lift and retain said highway wheel-set axle unit in its elevated stored inoperative position in the rail mode,

said vehicle also including conduit means for connecting said vehicle to a source of compressed air external to said body, rail brake and highway brake systems operatively connected to said conduit means, and an air control system operatively connected to said rail and highway air spring means and to said rail and highway brake systems,

said air control system comprising:

a. a three way mode selector valve connected to said conduit means for directing the application of pressure from said source of compressed air to said rail wheel-set axle unit air spring means when it is in a first position during a rail mode of travel, for directing the application of pressure from said source of compressed air to

said highway wheel-set axle air spring means when it is in a second position during a highway mode of travel, and for preventing the application of pressure from said source of compressed air to both said rail and highway wheel-set axle unit air spring means when it is in a third position during a transfer from one mode of travel to the other, and

b. levelling valves to control air from said source of compressed air to said rail and highway wheel-set axle air spring means to maintain them at predetermined heights.

6. In a vehicle convertible from highway to railroad mode of travel and vice versa including a body; a rail wheel-set axle unit, air spring means supporting said body on said rail wheel-set axle unit, a highway wheel-set axle unit, air spring means supporting said body on said highway wheel-set axle unit, means interconnecting said body and said rail wheel-set axle unit operative to left and retain said rail wheel-set axle unit in its elevated stored inoperative position in the highway mode, and means interconnecting said body and said highway wheel-set axle unit operative to lift and retain said highway wheel-set axle unit in its elevated stored inoperative position in the rail mode, said vehicle including rail brake and highway brake systems, and conduit means for connecting said vehicle to a source of compressed air external to said body,

an air control system operatively connected to said rail and highway air spring means and to said rail and highway brake systems, said rail brake system comprising:

a. rail brake cylinders, each cylinder including a service brake chamber and a spring brake chamber having a spring therein,

b. a rail brake to function as a parking brake when operated by said spring within said spring brake chamber,

c. a supply pipe operatively interconnecting said source of compressed air with said spring brake chamber,

said rail parking brake being released when said supply pipe remains operatively connected to said source of compressed air and said rail parking brake being applied when said supply pipe is vented to atmosphere.

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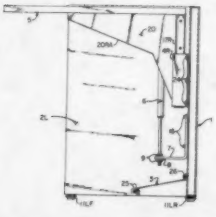
**4,381,714**

## CONTINUOUSLY ADJUSTABLE COMPUTER CONSOLE TABLE

**Helmut H. Henneberg, Canton; Ralph H. Arabian, Andover, and Howard A. Grant, Chelmsford, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Jan. 12, 1981, Ser. No. 224,589**
**Int. Cl.³ A47B 9/00**
**U.S. Cl. 108—147** **11 Claims**



1. A table having a continuously adjustable table top comprising:

A. a table top;

B. a frame;

C. a lockable gas spring;

D. a pair slides, each slide of said pair of slides having a long slideable member and a fixed member;

E. a cantilevered support rigidly fastened to said table top, said cantilevered support being a U-shaped member comprising:

1. a left arm;

2. a back panel; and

3. a right arm; said back panel having a length less than but approximately equal to the width of said table top, and wherein said long slideable member of a first of said pair of slides is fastened vertically to the rear edge of said left arm and said long slideable member of a second of said pair of slides is fastened vertically to the rear edge of said right arm and wherein each of said fixed members of said pair of slides is fastened vertically to said frame;

F. a lower spring bracket fastened to said frame and to a lower end of said lockable gas spring, said lower spring bracket for supporting said lockable gas spring, said cantilevered support, said table top and any article placed on said table top;

G. an upper spring bracket fastened to the underside of said table top and to an upper end of said lockable gas spring, said upper spring bracket for bearing the upward force of said lockable gas spring against the underside of said table top, and wherein said lower spring bracket is fastened to said frame approximately midway the lateral distance between said fixed members of said pair of slides and wherein said upper spring bracket is fastened to the underside of said table top approximately midway the lateral distance between said long slideable members of said pair of slides thereby aligning said lockable gas spring vertically in a plane perpendicular to said back panel; and

H. an unlocking means connected to said lockable gas spring, said unlocking means for controlling the length of said lockable gas spring when displaced to a first position allowing the lengthwise adjustment of said lockable gas spring and when displaced to a second position locking said lockable gas spring at its adjusted length.

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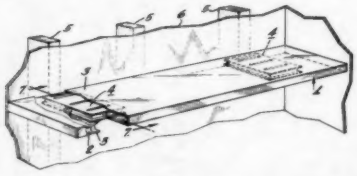
**4,381,715**

## ADJUSTABLE SHELF MOUNTING SYSTEM

**David M. Forman, 54 Gaylord Cir., Willingboro, N.J. 08046**

**Filed Sep. 4, 1980, Ser. No. 183,935**
**Int. Cl.³ A47B 5/00**
**U.S. Cl. 108—152** **8 Claims**

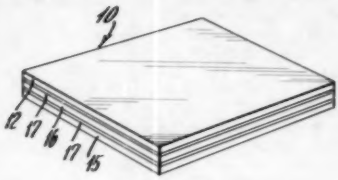


1. A wall mounting system for an elongated member with at least one hollow interior chamber having an opening on the side abutting a wall, said opening extending lengthwise of the elongated member, a detent means within the chamber running substantially lengthwise thereof, at least one elongated fastener member having on one end means for rigid securement to the wall and the other end projecting perpendicularly from the wall and spring means associated with said portion of said fastener extending perpendicularly from the wall, said spring means comprising a releasable locking portion biased radially outwardly from the fastener for interengagement with said detent means at selected positions lengthwise thereof.

## 4,381,716
## INSULATING APPARATUS AND COMPOSITE LAMINATES EMPLOYED THEREIN

Otis H. Hastings, and Otis M. Hastings, both of 130 E. Crescent Ave., Mahwah, N.J. 04730

Continuation-in-part of Ser. No. 912,974, Jun. 5, 1978. This application Dec. 11, 1979, Ser. No. 102,552
Int. Cl.³ E04B 2/02; E05G 1/024
U.S. Cl. 109—2 30 Claims




1. A transaction processing enclosure suitable for housing electronic data processing equipment, banking pay-out and receiving apparatus, documentation valuable articles and the like, that comprises a housing; at least one access means in said housing to the interior of said enclosure; closure means having outer surface conformance in size and shape, and registrable, with said access means to effect the opening and closing thereof, said housing and closure means comprising one or more panels including at least one outer ply which is reflective of radiant energy; at least one heat insulating ply of a ceramic refractory fibrous composition interior to said outer ply; and at least one structural support element disposed interior to said insulating ply; and a ply of refractory adhesive between each of said outer ply and said insulating ply and said insulating ply and said structural support element.

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## 4,381,717
## SECTIONAL SMOKESTACK

Alfons O. Krautz, 57 N. Country Rd., Shoreham, N.Y. 11786

Filed Jun. 5, 1980, Ser. No. 156,560
Int. Cl.³ F23J 11/00
U.S. Cl. 110—184 5 Claims

1. A smokestack having freestanding dual walls constructed of preassembled sections axially stacked one upon the other wherein a section comprises:

an outer wall having a flue aperture and an aperture in parallel relation to the axis of the flue aperture to be aligned with a corresponding aperture of an adjacent section in the smokestack for receiving reinforcing rods extending through multiple sections of the smokestack and for receiving poured concrete as the smokestack is being erected to tie outer walls of the sections together;

an inner flue liner spaced concentrically with the outer wall and within the flue aperture;

a flue liner support means mounted to the outer wall within the flue aperture;

the flue liner moveable independently of and axially with respect to the outer wall and having means for engaging the flue liner support means to prevent the flue liner from moving downwardly and out of the flue aperture.

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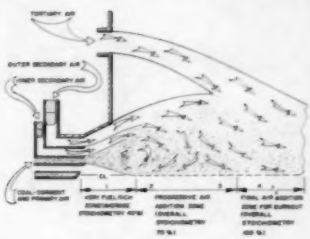
## 4,381,718
## LOW EMISSIONS PROCESS AND BURNER

George P. Carver, 26 Linda Isle, Newport Beach, Calif. 92660; Michael P. Heap, 1 Banyon Tree La., Irvine, Calif. 92715; G. Blair Martin, 1124 Askham Dr., Cary, N.C. 27511; David W. Pershing, 1582 Tomahawk Dr., Salt Lake City, Utah 84103; Dee P. Rees, 8 Bitterwood, Irvine, Calif. 92714, and Dennis M. Zallen, 14216 Turner Ct., Albuquerque, N. Mex. 87123

Filed Nov. 17, 1980, Ser. No. 207,208
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 10 Claims


TERTIARY AIR
OUTER SECONDARY AIR
INNER SECONDARY AIR
COAL-CARRIER AND PRIMARY AIR
VERY FUEL-RICH STOICHIOMETRY ZONE
PROGRESSIVE AIR ADDITION ZONE OVERALL STOICHIOMETRY
FINAL AIR ADDITION ZONE FOR OVERALL STOICHIOMETRY

1. A process for reducing the sulphur and nitrogen emissions during coal combustion comprising:

mixing together an uncalcined sorbent selected from the group consisting of alkaline and alkaline earth metal carbonates, bicarbonates, oxides and mixtures thereof and coal;

pulverizing said coal-sorbent mixture prior to combustion whereby the average particle size of said coal-sorbent mixture does not exceed 75 microns, mixing said sorbent and coal in proportions to provide a metal in the sorbent to sulphur in the coal stoichiometric ratio of at least 1, combusting said mixture under staged air conditions to provide favorable sorbent calcining conditions and to favor low $NO_x$ emissions by control of combustion temperature and coal-air stoichiometry, wherein said staged air conditions comprise primary, secondary, and tertiary air streams wherein said primary air stream provides between about 10% to about 30% of the stoichiometric air required to combust the coal, said secondary air stream provides about 40% to about 100% of the stoichiometric air required to combust the coal, said tertiary air supplies the balance of the stoichiometric air required to combust the coal, plus an excess of between about 25% to about 40%, controlling said combustion air whereby said primary air is preheated to a temperature in the range of about 150 degrees F. to about 160 degrees F., said secondary and tertiary air streams are preheated to a temperature in the range of about 400 degrees F. to about 750 degrees F.; and,

combusting said mixture to simultaneously burn said fuel and calcine said sorbent so that sulphur being evolved from the fuel during the combustion process will be adsorbed by said calcined sorbent.

**4,381,719**

## SEWING MACHINE WITH A STITCH COUNTER AND CORRECTION UNIT

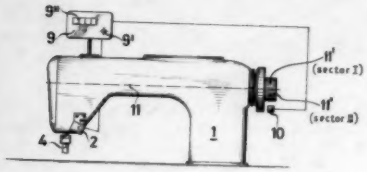
**Heinz Goldbeck, Bielefeld, Fed. Rep. of Germany, assignor to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany**

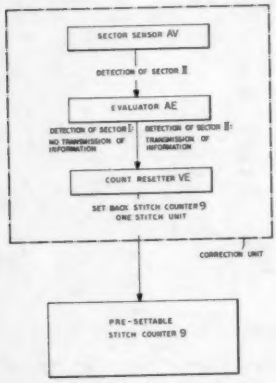
**Filed May 13, 1981, Ser. No. 263,172**

**Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018797**

**Int. Cl.**[3] **D05B** *19/00, 69/20, 69/22*

**U.S. Cl. 112—121.11** **5 Claims**





SECTOR SENSOR AV
DETECTION OF SECTOR II
EVALUATOR AE
DETECTION OF SECTOR I: NO TRANSMISSION OF INFORMATION
DETECTION OF SECTOR II: TRANSMISSION OF INFORMATION
COUNT RESETTER VE
SET BACK STITCH COUNTER 9 ONE STITCH UNIT
CORRECTION UNIT
PRE-SETTABLE STITCH COUNTER 9

1. In a sewing machine having a sewing machine arm and mechanism including a cyclically operating moving member for producing a succession of stitches forming a stitch seam, means for detecting the trailing edge of a workpiece part to be sewn with said seam, and a presettable stitch counter responsive to said detecting means for terminating operation of the sewing machine after the sewing of a number of stitches corresponding to that set in said counter, the improvement which comprises a correcting unit for controlling the count registered in said counter, said unit comprising sensing means responsive to at least two different sensing sectors of said member, evaluating means connected to said sensing means and generating an output when said sensing means responds to one of said sectors, and adjusting means connected to said evaluating means and responsive thereto to reset the count in said counter in accordance with the output of said evaluating means.

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**4,381,720**

## FABRIC ORIENTATING MECHANISM COOPERATING WITH A SEWING MACHINE

**Jack S. Abrams, Northbrook, Ill., assignor to Union Special Corporation, Chicago, Ill.**

**Filed Sep. 18, 1981, Ser. No. 303,650**

**Int. Cl.**[3] **D05B** *21/00*

**U.S. Cl. 112—121.15** **7 Claims**

1. A carriage system means including:

first and second set of roller means;

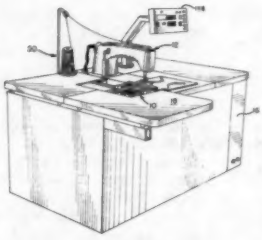
a first frame means, having a major plane, carrying said first set of roller means;

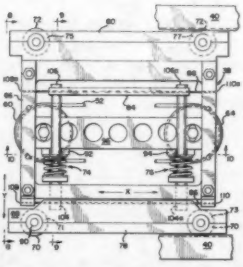
first and second flex hinge means each having a major plane generally perpendicular to the major plane of said frame means, each of said first and second flex hinge means having end means, said end means being secured to said first frame means;

first and second loading and compensating means disposed between said first and second flex hinge means each having a line of action generally parallel with the major plane of said first frame means; and

a second frame means carrying said second set of roller means and being secured to said second flex hinge means whereby the location of said first set of roller means can vary with respect to said second set of roller means.

7. A machine for sewing flexible material including a sewing machine means, a clamp means for securing said flexible material, a carriage assembly means carrying said clamp means and a microprocessor means for directing the action of the carriage assembly means and sewing machine means to perform the





predetermined sewing operation, said carriage assembly means comprising:

first and second guide rail set means disposed at right angles to each other in spaced apart parallel planes;

first and second carriage means, said first carriage means being associated with said first guide rail set means, both of which are carried by said second carriage means which is associated with said second guide rail set means;

first and second set of roller means secured to said first carriage means, engaging said first guide rail set means whereby said first carriage means can move therealong;

first and second flex hinge means associated with said first and second set of roller means whereby said set of roller means are urged against said guide rail means in a single plane and can move with respect to each other;

third and fourth set of roller means secured to said second carriage means, engaging said second guide rail means whereby said carriage means can move therealong; and

third and fourth flex hinge means associated with said third and fourth set of roller means whereby said set of roller

means are urged against said guide rail means in a single plane and can move with respect to each other.

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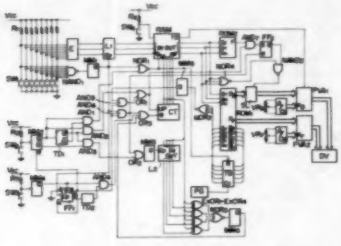
4,381,721

## ELECTRONIC SEWING MACHINE

Hachiro Makabe, Kanagawa, and Haruhiko Tanaka, Mitaka, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,985
Claims priority, application Japan, Oct. 31, 1980, 55/152366
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 E 1 Claim



1. An electronic sewing machine substantially comprising; a first memory storing stitch control data for different stitch patterns including a pattern of straight stitches, pattern selecting means including a number of pattern selecting switches selectively operated to produce a pattern signal designating the corresponding one of the patterns stored in the first memory, pattern memory control means operated to determine a combination of different patterns including the straight stitches, a second memory operated in response to the operation of the pattern selecting switches and of the pattern memory control means to memorize the combination of different patterns in a predetermined sequence, a third memory storing group signals for dividing the different patterns into a predetermined number of groups and produce a group signal at the time of production of a pattern which belongs to a group, register means receiving the group signals of the third memory to register one of the group signals in accordance with the sequence of the patterns to be produced in combination, thereby to determine the stitch co-ordinates of the straight stitches, and calculating means operated in response to the stitch control signal of the first memory and the output signal of the register means to convert the stitch control signal of the straight stitches into the stitch co-ordinates determined by the group signal of the register means.

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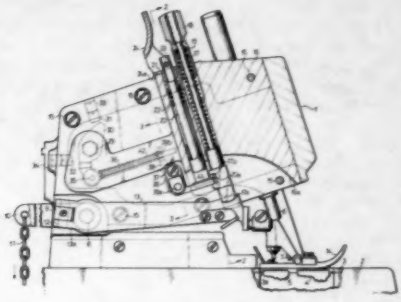
4,381,722

## SEWING MACHINE

Toshikatu Takeuchi, Anjo; Kihei Goto, Konan; Yasuro Ichihashi, Inazawa, and Takenori Kawase, Gifu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 4, 1981, Ser. No. 259,983
Claims priority, application Japan, May 13, 1980, 55-63131; May 20, 1980, 55-67008
Int. Cl.³ D05B 29/02, 71/00
U.S. Cl. 112—235 11 Claims

1. A sewing machine comprising;
a frame defining an inner chamber therein and having a work supporting surface thereon,
a presser foot for downwardly depressing a work on said work supporting surface,
pressure imparting means for applying a downward pressure to said pressure foot,
a main shaft rotatably supported on said frame,
an oil reservoir disposed adjacent to said inner chamber,
an oil pump disposed in said inner chamber and drivingly connected with said main shaft, said oil pump including an inlet port drawing the oil from said oil reservoir and an outlet port delivering the oil under the pressure corresponding to the speed of said main shaft, and



presser actuating means provided between said oil pump and said presser foot, said presser actuating means applying an additional downward pressure to said presser foot by means of the oil from said outlet port so as to increase the downward pressure of said presser foot.

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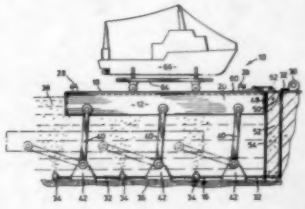
4,381,723

## SUBMERSIBLE DRYDOCK

Jan Furst, St. Johns, Canada, assignor to Nordco Limited, St. Johns, Canada

Filed Apr. 6, 1981, Ser. No. 251,166
Int. Cl.³ B63C 1/06
U.S. Cl. 114—45 2 Claims



1. A drydock system comprising,
(a) a shore-based stationary dock having an upper face and an outer side wall,
(b) a submersible platform having an upper support face, a front end and an underside, said front end being disposed opposite said outer side wall of said shore-based stationary dock, a buoyancy cavity formed in said underside and opening downwardly therefrom, vent means adapted to open to vent said cavity and to close to make the cavity airtight, said platform being capable of submerging under its own weight when said vent means is open and said buoyancy cavity is flooded and being sufficiently buoyant to float and raise a vessel of a predetermined weight from the body of water when said vent means is closed and said cavity is filled with air,
(c) foundation means underlying said platform and disposed adjacent said outer side wall of said stationary dock,
(d) guide means for guiding said platform along a predetermined path extending in an arc from a raised position in which said front end of said platform is juxtaposed, said outer side wall of said stationary dock to a submerged position spaced outwardly from the stationary dock, said

platform moving in a first direction when moving from said lowered position to said raised position and a second direction moving from said raised position to said lowered position, said guide means comprising a parallelogram linkage system interconnecting the platform and the foundation means, said parallelogram linkage system being arranged over top dead center in said first direction when said platform is in said raised position, whereby a loss of buoyancy in the platform would result in the movement of the platform to a position in which the front end thereof bears against the outside wall of the stationay dock thereby preventing significant lowering of the platform,

(e) buoyancy control means communicating with said buoyancy chamber for varying the amount of air within said chamber to effect raising and lowering of said platform relative to said foundation means,

(f) means for securing said platform against movement with respect to said shore-based stationary dock when said platform is in said raised position.

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**4,381,724**

## COAL FIRED SHIP

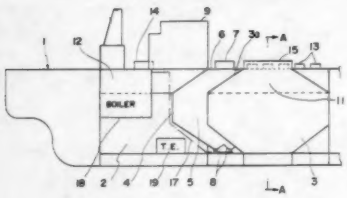
**Kiyoshi Iwai, Kashiwara, and Shinjiro Goto, Kyoto, both of Japan, assignors to Hitachi Shipbuilding and Engineering Company, Limited, Osaka, Japan**

**Filed Mar. 6, 1981, Ser. No. 241,097**

**Claims priority, application Japan, Mar. 21, 1980, 55-37520[U]**

**Int. Cl.³ B63B *11/04***

**U.S. Cl. 114—65 R** **7 Claims**




1. A coal fired ship comprising, from stern to stem, an engine room, a main coal bunker next to the engine room and separated therefrom by a transverse bulkhead, and at least one hold next to the main coal bunker, wherein said one hold has its aft wall projecting at the center portion thereof toward the stern to provide upper and lower spaces between the deck and the hold and between the bottom and the hold respectively, and said main coal bunker incorporating said spaces is formed between said transverse bulkhead and said aft wall by bending or curving the bulkhead at its center portion to project into the engine room.

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**4,381,725**

## ACTUATORS FOR SMALL SAILING CRAFT

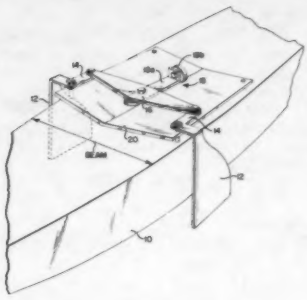
**James P. Rowan, 15923 Scandia Rd. Northeast, Poulsbo, Wash. 98370**

**Filed Apr. 3, 1981, Ser. No. 250,584**

**Int. Cl.³ B63B *39/06***

**U.S. Cl. 114—126** **8 Claims**

1. Actuators for use with a small sailing craft to stabilize the craft and to provide self-righting capacity, comprising a pair of fins pivotally mounted and disposed on opposite sides of the craft, each fin extending downward below the hull of the craft to act like a centerboard, a tie rod connecting the fins to allow their simultaneous pivoting, and a pendulum for actuating the simultaneous pivoting when the craft lists to turn the fins



through the tie rod so that the list of the craft will automatically be reduced.

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**4,381,726**

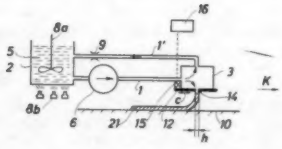
## APPARATUS FOR APPLYING STRIPE MATERIAL TO A SOLID SURFACE

**Svend Hojberg, Vejen, Denmark, assignor to A/S Phonix Tagpap OG Vejmaterialer, Vejen, Denmark**

**Filed Nov. 17, 1981, Ser. No. 322,293**

**Int. Cl.³ B05C *5/02***

**U.S. Cl. 118—315** **8 Claims**



1. An apparatus for applying hot thermoplastic stripe material to a solid surface as the apparatus is moved along the surface, said apparatus comprising a pipe circuit including a container for stripe material and provided with a heating and stirring unit, a pump and an applying device for said material, as well as an electronic control means controlling the applying device, characterized in that the applying device comprises a plurality of adjoining controllable gates, whereby each gate opening has a width dimension across the moving direction corresponding to a width module of a multi-stripe complex to be applied to the surface and a dimension in the moving direction corresponding to the thickness of the material applied, the total width dimensions of said gates at least corresponding to the total width of the multi-stripe complex to be applied to the surface, and fluid-operated actuating means on the applying device for quick opening and closing of the gates, said actuating means comprising at least one fluid-operated cylinder with a piston and piston rod as well as a rocking device connecting the piston rod and the gate plates of the gates, the piston rod adjacent its free end comprising flange portions located at regular intervals and on each side of the rocking device in order to impact on the rocking device in such a manner that the gates may be opened and closed substantially instantaneously.

**4,381,727**

## SEALING AGENT INJECTING MACHINE

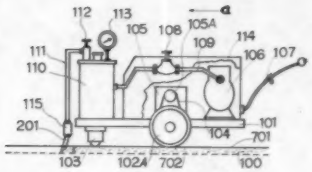
**Etsuji Yamaguchi, and Hideo Hotta, both of Tokai, Japan, assignors to Aron Kasei Co., Ltd., Tokyo, Japan**

**Filed Aug. 22, 1980, Ser. No. 180,415**

**Claims priority, application Japan, Aug. 24, 1979, 54/117314[U]; Feb. 15, 1980, 55/018162; Feb. 15, 1980, 55/018626[U]; Jun. 17, 1980, 55/085092[U]**

**Int. Cl.³ B05C 5/02, 7/06**

**U.S. Cl. 118—408** **4 Claims**




1. A sealing agent injecting machine which comprises:

(a) a frame;

(b) an axis rotatably mounted on the mid-section of the frame;

(c) a pair of wheels attached to opposing ends of the axis;

(d) a motor mounted on the frame over the mounting of the axis;

(e) a differential gear system connected to the axis, the wheels and the motor so as to enable movement of the frame;

(f) a vessel containing sealing agent mounted on the frame;

(g) a sub-wheel rotatably mounted on the frame below the vessel containing sealing agent; and

(h) a nozzle connected to the vessel containing sealing agent and positioned within an area to be filled with sealing agent at a fixed angle which is obtuse to the direction of movement of the frame.

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**4,38[illegible],728**

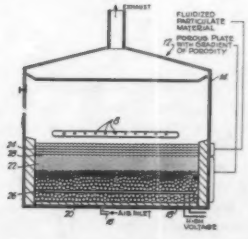
## FLUIDIZABLE BED STRUCTURE

**Jorg-Hein Walling, Beaconsfield; Gerald R. Arbuthnot, Chateauguay, and Andre Dumoulin, Deux Montagnes, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed Oct. 19, 1981, Ser. No. 312,651**

**Int. Cl.³ B05C 3/15; B05D 1/22, 7/20**

**U.S. Cl. 118—621** **16 Claims**




1. A fluidized bed structure comprising a housing, a rigid porous support within the housing for carrying a bed of fluidizable powder and for supplying fluidizing gas through the support and into the powder, the support having a depth from a support surface of at least 2 inches and having its porosity formed by interstices passing through the support, the interstices reducing in total area from an input side of the support to the support surface.

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**4,381,729**

## ELECTROSTATIC POWDER-DEPOSITING INSTALLATION

**Alain Gernez, Orleans, France, assignor to Compagnie Europeenne pour l'Equipment Menager "CEPEM", Paris, France**

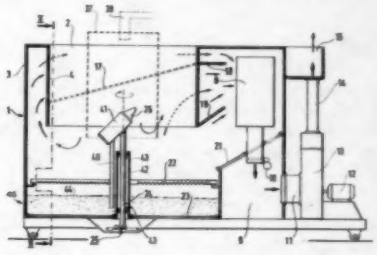
**PCT No. PCT/FR80/00124, § 371 Date Mar. 27, 1981, § 102(e) Date Mar. 24, 1981, PCT Pub. No. WO81/00362, PCT Pub. Date Feb. 19, 1981**

**PCT Filed Jul. 22, 1980, Ser. No. 253,761**

**Claims priority, application France, Jul. 27, 1979, 79 19474**

**Int. Cl.³ B05B 5/04**

**U.S. Cl. 118—622** **13 Claims**



1. In an electrostatic powder-depositing installation for depositing powder on the interior of hollow parts of large dimensions, said installation comprising: a powder-depositing cage, a powder-depositing unit placed within said cage using air for depositing powder on said hollow parts, a vacuum pressure filtering system for removing non-deposited powder from the air used in the coating operation, a system for supplying powder to said powder-depositing unit, and a non-deposited powder recovery tank for recovery of powder, the improvement wherein said powder-depositing cage comprises vertical exterior walls and a horizontal top wall, vertical interior walls extending downwardly from said top wall towards the bottom of the cage but terminating short of said cage bottom and being spaced from said vertical exterior walls to define a relatively large opening within the top wall of said cage through which non-deposited powder tends to escape, and forming a powder-depositing chamber such that downwardly open hollow parts may be vertically dropped to fit over the powder-depositing unit positioned within said chamber by passage of the hollow parts through the opening within the top wall of the powder-depositing cage, and wherein said top wall and said interior and exterior walls define a peripheral chamber for collecting of air bearing non-deposited powder, said peripheral chamber leading to said filtering system such that air loaded with said non-deposited powder is vacuum drawn into the peripheral chamber and thereby prevented from escaping through the cage top wall opening and is subsequently filtered in said filtering system to collect the non-deposited powder, said non-deposited powder being recovered by said recovery tank connected to said filtering system, and recycled to the powder-depositing unit connected to said recovery tank for further employment in the projection of powder onto said parts.

**4,381,730**

## FILTER ROD MANUFACTURE

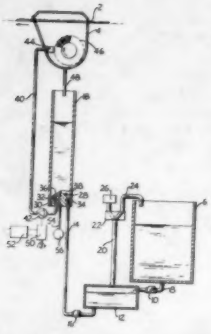
**Hugh M. Arthur, High Wycombe, England, assignor to Molins Limited, Bucks, England**

**Filed Dec. 18, 1980, Ser. No. 217,771**

**Claims priority, application United Kingdom, Dec. 20, 1979, 7943971**

**Int. Cl.³ B05D 1/02; B05B 9/00**

**U.S. Cl. 118—674** **34 Claims**



1. Apparatus for making filter rod from filter tow, comprising applicator means for applying fluid additive to a moving filter tow, means defining an endless flow path for fluid additive, said applicator means being located in said path, means for supplying fluid additive to said applicator means at a controlled rate along said flow path, means for measuring the flow rate in said path downstream of said applicator means and upstream of said supplying means, means for determining a characteristic of the filter rod or tow, and control means for varying the rate of application of fluid additive in accordance with signals derived from said measuring means and said determining means.

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**4,381,731**

## HYDRAULIC POWER SYSTEM FOR A PLURALITY OF OPERATING UNITS IN A POULTRY OF LIVESTOCK CONFINEMENT HOUSE

**Terry A. Dill, Keota, Iowa, assignor to Jefferson Industries Company, Fairfield, Iowa**

**Filed Aug. 6, 1981, Ser. No. 290,715**

**Int. Cl.³ A01K 1/00, 31/00; F15B 11/16**

**U.S. Cl. 119—21** **6 Claims**

1. A hydraulic power system for operating a plurality of fluid motors, separately or jointly and each of which has an inlet and an outlet, said power system comprising:

(a) a single hydraulic pump having an inlet and an outlet,

(b) an electrical motor for driving said pump,

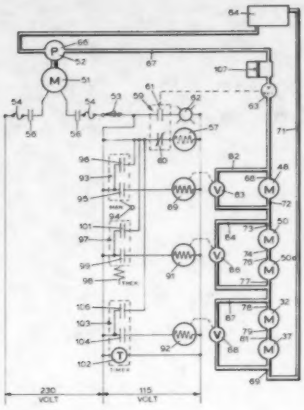
(c) a source of fluid for said pump connected to the inlet thereof,

(d) means connecting said motors in series with each other and with said pump, with the inlet of the first one of the motors in said series connected to the pump outlet, and the outlet of the last one of the motors in the series connected to said fluid source,

(e) a fluid by-pass line extended between and connected to the inlet and outlet of each motor,

(f) an electrically operated normally open shut-off valve in each fluid by-pass line, and

(g) an electrical circuit for said electric motor including an actuator means associated with each shut-off valve and with said electrical motor to energize said circuit to con-



currently operate said electrical motor and close a shut-off valve.

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**4,381,732**

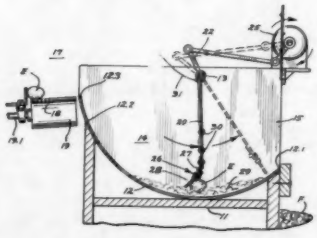
## POULTRY NEST

**Theodore G. Huisinga, Rte. 4, Willmar, Minn. 56201**

**Filed Nov. 9, 1981, Ser. No. 319,584**

**Int. Cl.³ A01K 31/14, 31/16**

**U.S. Cl. 119—45 R** **7 Claims**



6. An egg collecting poultry nest comprising,

an enclosure having an open front for access into the enclosure, the enclosure also having a bottom panel with an upwardly facing concave shape,

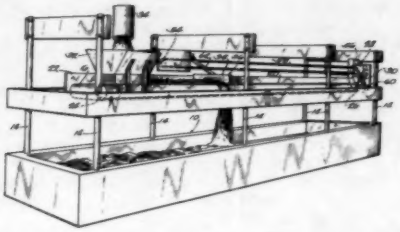
a swingably powered pusher panel with an upper edge swingably mounted on the enclosure and a lower portion swinging along the concave bottom panel toward the open front to push a poultry hen off the nest and alternately swinging away from the open front to move an egg rearwardly on the bottom panel, the lower portion of the pusher panel defining an articulated comb with stiff depending fingers extending to the bottom panel for carrying an egg toward the open rear of the enclosure, the articulated comb being tiltable upwardly during swinging of the pusher panel toward the open front to pass over an egg on the bottom panel.

**4,381,733**

## LIVESTOCK FEED CONVEYOR INCLUDING CABLE CLAMP

**Paul Patz; Howard G. Patz, both of Pound; Russell W. Cleven, Marinette, and James M. Hackbarth, Suring, all of Wis., assignors to Patz Company, Pound, Wis.**

**Filed Dec. 3, 1981, Ser. No. 327,106**
**Int. Cl.³ A01K *5/02***
**U.S. Cl. 119—52 B** **18 Claims**



1. Apparatus for depositing cattle feed in an elongated bin in a evenly distributed relation, the apparatus for depositing feed including

a conveyor belt having a surface for supporting feed,

means for continuously driving the conveyor belt,

means for depositing feed on said supporting surface of said conveyor belt,

a plow including a plow face positioned adjacent said supporting surface and adapted to sweep feed off of said conveyor belt, and

means for causing reciprocating movement of said plow along the length of said conveyor belt including

a pair of pulleys, one of said pulleys being supported adjacent one end of said conveyor belt and another of said pulleys being supported adjacent an opposite end of said conveyor belt,

a flexible metal cable reeved over said pulleys and forming a continuous cable having opposite ends,

means for driving said cable for continuous movement around said pulleys, and

means for connecting said cable to said plow, said means for connecting including means for clamping said opposite ends of said cable together and cable guide means adjacent said cable clamp means and for supporting the ends of said cable such that said ends each define a smooth curve.

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**4,381,734**

## LIVESTOCK FEED CONVEYOR INCLUDING BELT RETAINER

**Paul Patz; Howard G. Patz, both of Pound; Russell W. Cleven, Marinette, and James M. Hackbarth, Suring, all of Wis., assignors to Patz Company, Pound, Wis.**

**Filed Dec. 3, 1981, Ser. No. 327,129**
**Int. Cl.³ A01K *5/02*; B65G *47/00***
**U.S. Cl. 119—52 B** **6 Claims**

1. Apparatus for depositing cattle feed in an elongated bin in an evenly distributed relation, the apparatus for depositing feed including

a frame including an elongated horizontal surface having opposite edges and a vertical wall extending upwardly from one of said edges and extending along the length of said one of said edges,

a conveyor belt supported on said elongated horizontal surface and having a surface for supporting feed, said conveyor belt including opposite edges, one of said edges being positioned adjacent the other of said edges of said elongated horizontal surface,

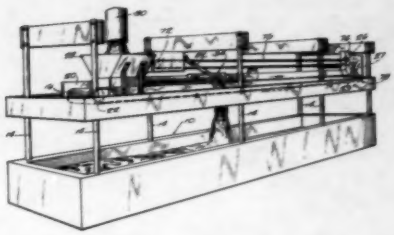
means for continuously driving said conveyor belt,

means for depositing feed on said surface of said belt,

a plow including a plow face positioned adjacent said supporting surface of said conveyor belt and adapted to sweep feed over said edge of said conveyor belt into said elongated bin, said plow including a leading portion and a trailing portion,

means for causing reciprocating movement of said plow along the length of said horizontal surface,

means for securing said plow to said frame as said plow moves reciprocably back and forth along the length of



said frame, said means for securing said plow to said frame including a member connected to said plow and extending over said upper edge and,

means for restraining said belt on said frame, said means for restraining including a restraining member carried by said plow and engaging said one of said edges of said belt, said restraining member including a foot positionable beneath said one of said edges of said belt, and means for connecting said foot to said trailing portion of said plow.

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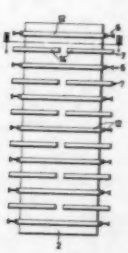
**4,381,735**

## CRADLE SYSTEM FOR A STEAM GENERATOR

**Alfred Brunner, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Aug. 27, 1981, Ser. No. 297,044**
**Claims priority, application Switzerland, Aug. 29, 1980, 6507/80**
**Int. Cl.³ F22B *37/24***
**U.S. Cl. 122—510** **11 Claims**



11. In combination

a steam generator having four upstanding flat diaphragm walls disposed at right angles to each other;

a plurality of cradles encompassing a periphery of said generator and being spaced longitudinally along said generator for supporting said walls, each said cradle including a plurality of flexural members disposed in spaced relation to each other around said generator to define a gap between each pair of adjacent members and successive cradles being disposed in pairs with at least one gap of one cradle of said pair of cradles being offset from the gaps of an adjacent cradle of said pair of cradles; and

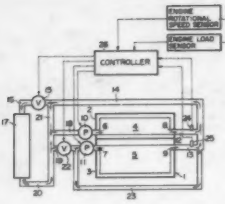
a plurality of spaced apart pressure elements securing each flexural member to at least one of said diaphragm walls.

4,381,736

## ENGINE COOLING SYSTEM PROVIDING MIXED OR UNMIXED HEAD AND BLOCK COOLING

Tsutomu Hirayama, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 17, 1981, Ser. No. 255,056
Claims priority, application Japan, Apr. 18, 1980, 55-52025
Int. Cl.³ F01P 7/16
U.S. Cl. 123—41.1 60 Claims




1. For an internal combustion engine comprising:
(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;
(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and
(c) a radiator formed with an inlet and an outlet;
a cooling system, comprising:
(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;
(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;
(f) a block output fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket, and for generating a sensed block output temperature signal representative of said temperature;
(g) a block recirculation conduit system of relatively high flow resistance, leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid to said cylinder block inlet thereof;
(h) a main recirculation conduit system, an upstream part of which is communicated both to said cylinder head outlet of said head cooling jacket and also to said cylinder block outlet of said block cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;
(i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket;
(j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;
(k) a radiator bypass conduit system, of relatively high flow resistance, which leads from a downstream part of said main recirculation conduit system both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, operation of said first control valve so as to cut off said flow of cooling fluid through said radiator not cutting off flow of cooling fluid through said radiator bypass conduit system;
(l) a second control valve for controlling flow of cooling fluid from said radiator output conduit system and said radiator bypass conduit system to said cylinder block inlet of said block cooling jacket according to a block flow regulation signal; and
(m) a controller, which receives said sensed block output temperature signal from said block output fluid temperature sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve.

39. A method for operating a cooling system for an internal combustion engine, said engine comprising:
(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;
(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and
(c) a radiator formed with an inlet and an outlet; a cooling system comprising:
(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;
(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;
(f) a block output fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket, and for generating a sensed block output temperature signal representative of said temperature;
(g) a block recirculation conduit system of relatively high flow resistance, leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid to said cylinder block inlet thereof;
(h) a main recirculation conduit system, an upstream part of which is communicated both to said cylinder head outlet of said head cooling jacket and also to said cylinder block outlet of said block cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;
(i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket;
(j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;
(k) a radiator bypass conduit system, of relatively high flow resistance, which leads from a downstream part of said main recirculation conduit system both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, operation of said first control valve so as to cut off said flow of cooling fluid through said radiator not cutting off flow of cooling fluid through said radiator bypass conduit system;
(l) a second control valve for controlling flow of cooling fluid from said radiator output conduit system and said radiator bypass conduit system to said cylinder block inlet of said block cooling jacket according to a block flow regulation signal; and
(m) a controller, which receives said sensed block output temperature signal from said block output fluid temperature sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve,
when said cooling system is filled with cooling fluid, comprising the processes, simultaneously performed, of:
(n) operating said first pump and said second pump; and
(o) depending upon said sensed block output temperature signal from said block output fluid temperature sensor, performing either one or the other but not both of the following two processes (p) and (q):
(p) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said

block cooling jacket of less than a certain first predetermined temperature value, then simultaneously:

(p1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as substantially to interrupt flow of cooling fluid through said radiator; and

(p2) controlling said second control valve, by said block flow regulation signal, so as to allow a flow of cooling fluid through said radiator bypass conduit system from a downstream part of said main recirculation conduit system to said cylinder block inlet of said block cooling jacket;

(q) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of greater than said first predetermined temperature value, then simultaneously:

(q1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as to allow cooling fluid to flow through said radiator; and

(q2) controlling said second control valve, by said block flow regulation signal, so as to allow a controlled flow of cooling fluid from said radiator and said radiator output conduit system to said cylinder block inlet of said block cooling jacket.

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**4,381,737**

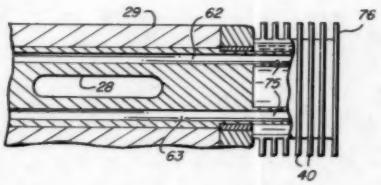
## ROTARY VALVED INTERNAL COMBUSTION ENGINE

**William H. Turner, 12 S. Monitor Pl., Tucson, Ariz. 85710**

**Filed Nov. 13, 1980, Ser. No. 206,570**

**Int. Cl.³ F01P 3/14**

**U.S. Cl. 123—41.4** **4 Claims**




1. In combination with an internal combustion engine, including

a housing,

at least one combustion chamber formed in said housing,

passage means formed in said housing for communicating a combustible mixture to said combustion chamber and for transporting exhaust gases from said combustion chamber,

ignition means for igniting said combustible mixture in said combustion chamber,

at least one cylindrical valve member rotatably journalled in said housing and having

at least one opening formed therein, and

an imaginary centerline generally equidistant from points on the cylindrical surface of said valve member,

said rotary valve member being disposed in said passage means such that said opening selectively establishes fluid communication through at least a portion of said passage means at predetermined rotational positions of said rotary valve member, and

means for rotatably driving said valve member in synchronism with the operation of said engine,

means for cooling said rotary valve member during the operation of said internal combustion engine, said cooling means including

(a) an elongate heat pipe having at least two operative sections,

(i) an evaporator section carried within said rotary valve member to absorb heat from the valve during operation of said engine, said absorbed heat vaporizing liquid condensate contained in said evaporator section, and

(ii) a condensor section positioned outside said rotary valve member for receiving and condensing said vaporized liquid flowing from said evaporator section, said condensate produced in said condensor section flowing to said evaporator section,

the positioning of said heat pipe in said rotary valve member

increasing the efficiency of the heat pipe in cooling said rotary valve member, and minimizing distortion of said valve member which occurs during operation of said engine.

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**4,381,738**

## ENGINE WITH ADDITIONAL SHARED FLOW CONTROL RUNNER FOR TWO CYLINDERS

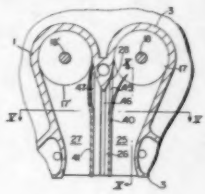
**Donald J. Shaffer, P.O. Box 88, Upper Strasburg, Pa. 17265**

**Continuation-in-part of Ser. No. 24,049, Mar. 26, 1979, Pat. No. 4,232,639. This application Nov. 10, 1980, Ser. No. 205,649**

**The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.**

**Int. Cl.³ F02B 75/18**

**U.S. Cl. 123—52 M** **34 Claims**



1. A head for an internal combustion engine having an air intake manifold and engine block with plural cylinders, comprising:

a first surface for engagement with the corresponding surface of an engine block having in it the engine cylinders;

a plurality of intake ports opening through said first surface so as to be in communication with respective cylinders when said head is assembled on the block;

a plurality of exhaust ports extending through said first surface so as to be in communication respectively with the cylinders when said head is assembled on the block;

a valve seat in each of said intake ports and exhaust ports;

a plurality of intake and exhaust valves movable between opened and closed positions with respective ones of said intake and exhaust valve seats;

a second surface on said head for mating engagement with an intake manifold;

an intake opening in said second surface;

an intake passage extending from said intake opening to two adjacent intake valve seats that respectively lead to two adjacent intake ports that are respectively in communication with adjacent cylinders when said head is assembled on the block;

said intake passage having at least two partitions dividing said passage into at least three parallel noncommunicating conduits having entrance ends at said intake opening of said second surface and exit ends at said two adjacent intake valve seats;

means mounting each of said partitions separately in said head so as to be removable through said intake opening for replacement; and

said passage and partitions being so constructed as to form means for conducting a working fluid from said one intake opening in said second surface through a first one of said conduits and a second one of said conduits to one intake valve seat when its associated valve is open exclusive of the third one of said conduits, and for conducting a work-

ing fluid through said one intake opening in said second surface through said second and third conduits to the other of said intake valve seats when its associated valve is open exclusive of said first conduit, so that two out of the three conduits may be used for each of the cylinders to provide a large flow passage with good flow characteristics provided by a partition at high engine speed.

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**4,381,739**

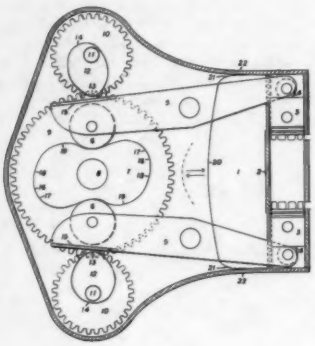
**CAM INTERNAL COMBUSTION ENGINE**

**Patrick T. Fisher, 2005 S. Cooper, Arlington, Tex. 76010**

**Division of Ser. No. 102,313, Dec. 10, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,268**

**Int. Cl.³ F02B** *75/26*

**U.S. Cl. 123—54 B** **1 Claim**



1. A two-stroke internal combustion engine, comprising:
a block,
cylinder means carried by said block,
two pistons supported in said cyliner means for reciprocal movement in opposite directions,
a piston rod connected to each piston,
two rocker levers, each having first and second ends,
each rocker lever being pivotally connected to said block for pivotal movement about a pivot axis between its first and second ends,
said pivot axes of said two rocker levers being spaced from each other,
the first ends of said rocker levers being pivotally connected to said piston rods respectively whereby reciprocal movement of said piston rods causes said rocker levers to rock back and forth,
a rotatable main cam connected to a main shaft carried by said block,
said main cam causing said main shaft to rotate upon rotation of said main cam,
said main cam being located between said second ends of said rocker levers,
rollers connected to said second ends of said rocker levers for engaging said main cam for causing said main cam to rotate upon reciprocal movement of said pistons,
a main gear coupled to said main shaft for rotation therewith,
secondary shafts carried by said block on opposite sides of said main gear,
said secondary shafts and said main shaft being in line with each other,
secondary gears coupled to said secondary shafts and having teeth meshing with the teeth of said main gear whereby rotation of said main gear causes rotation of said secondary gears and hence said secondary shafts,
secondary cams connected to said secondary shafts for rotation therewith for engaging said rocker levers for causing said rollers to engage said main cam, and
flexible diaphragm means located to seal said cylinder means from said cams and gears and actuated by movement of said rocker levers.

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**4,381,740**

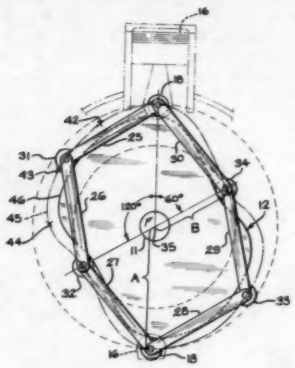
**RECIPROCATING ENGINE**

**Alfred J. Crocker, 4906 Naomi Dr., Toledo, Ohio 43623**

**Filed May 5, 1980, Ser. No. 146,672**

**Int. Cl.³ F02B** *75/26*

**U.S. Cl. 123—58 AA** **2 Claims**



1. In a reciprocating piston engine having a rotatable shaft, at least one cylinder extending radially from the shaft, and a piston adapted to reciprocate in the cylinder, the improvement comprising: a cam attached to the shaft and having a peripheral camming surface defined by a major diameter and a minor diameter, the major and minor diameters intersecting at the axis of rotation of the rotatable shaft, at least six cam followers spaced about and in contact with the camming surface of said cam, at least six substantially equal length linkages, a separate one of said linkages extending between each two adjacent cam followers about said cam, said linkages maintaining said cam followers in contact with the camming surface of said cam as said cam and said shaft rotate, at least four of said cam followers adapted to travel in a circuitous closed loop path spaced from the axis of rotation as said cam and said shaft rotate, means connecting the piston to one of the other of said cam followers whereby the piston reciprocates as said cam rotates and said one cam follower travels in a radially linear path coaxial with said piston, and wherein the major and minor diameters of said cam are displaced from one another by other than 90° in a direction to reciprocate the piston outwardly from the shaft over less than 90° of shaft rotation and to reciprocate the piston inwardly toward the shaft over greater than 90° shaft rotation whereby the duration of the inward reciprocation of the piston is greater than the duration of the outward reciprocation of the piston.

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**4,381,741**

**MECHANICAL FUEL PRESSURE OPERATED DEVICE FOR SUPPLYING A FUEL/OIL MIXTURE**

**Frank J. Walsworth, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.**

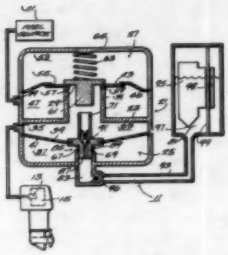
**Filed Oct. 8, 1981, Ser. No. 309,558**

**Int. Cl.³ F01M** *3/00;* **F02B** *33/06*

**U.S. Cl. 123—73 AD** **17 Claims**

1. A combined oil pumping and fuel supplying device comprising a housing including means defining a variable volume discharge chamber which is adapted for fluid communication

with a point of use and which varies in volume between a greater volume and a lesser volume, means defining an inlet chamber which is adapted to communicate with a source of fuel under pressure and which varies in volume between a larger volume and a smaller volume, valve means communicating between said discharge chamber and said inlet chamber and operable between open and closed positions, means displacing said valve means to said open postion in response to contraction of said discharge chamber to said lesser volume, means displacing said valve means to said closed position in response to contraction of said inlet chamber to said smaller volume, and means responsive to variation in volume of one of said discharge chamber and said inlet chamber for pumping oil for supply to a point of use.



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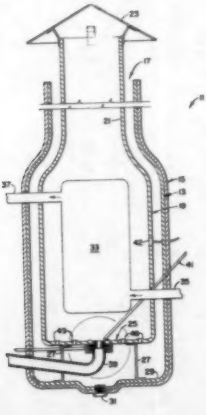
**4,381,742**

## ENGINE COOLANT HEATER

**Francis C. Funk, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed May 7, 1979, Ser. No. 36,863**
**Int. Cl.³ F02N *17/02***
**U.S. Cl. 123—142.5 R** **5 Claims**



**1.** An engine coolant heater for use in conjunction with a liquid-cooled engine, said engine coolant heater to use a combustible fuel:

(a) a housing;

(b) a combustion chamber fixably mounted in said housing;

(c) fuel delivery means for delivering said combustible fuel;

(d) fuel ignition means for providing sufficient thermal energy to ignite said combustible fuel;

(e) burner means for receiving and containing said combustible fuel from said fuel delivery means in sufficient proximity to said fuel ignition means such that said combustible fuel can be ignited by fuel ignition means, said burner means to receiving said combustible fuel at a rate sufficient to support controlled continued self-sustained combustion of said combustible fuel, said burner means including;

(i) a base having a plurality of holes extending vertically through said base, said base to contain a formed rim elevated as compared to the top surface of said base around each of said holes;

(ii) a metering orifice fixably mounted in said base and extending slightly beyond said bottom of said base in communication with said fuel delivery means;

(f) a coolant tank fixably mounted in said combustion chamber in sufficient proximity to said burner means to receive appreciable amounts of thermal energy resulting from said fuel combustion, said coolant tank being thermal-energy conductive;

(g) coolant inlet means for admitting coolant from said engine into said coolant tank;

(h) coolant outlet means for permitting coolant to flow from said coolant tank once said coolant has received a sufficient amount of thermal-energy to said engine.

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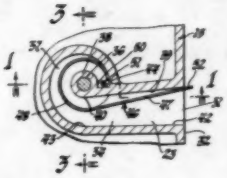
**4,381,743**

## VARIABLE AREA SWIRL GENERATING ENGINE CYLINDER INLET PORT

**Alex C. Mair, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Feb. 26, 1981, Ser. No. 238,492**
**Int. Cl.³ F01L *3/00***
**U.S. Cl. 123—188 M** **3 Claims**



**1.** A variable area, swirl generating, intake system for an internal combustion engine having a cylinder closed at one end, means defining an inlet port through the cylinder closed end and communicating with the cylinder, and a poppet inlet valve having a central axis and reciprocably disposed in the port for controlling communication of the inlet port with the cylinder, said inlet port being characterized by

a throat portion of generally circular cross-section opening into the cylinder and adapted to be closed by the inlet valve,

an entrance portion spaced upstream from the throad portion,

a fluid flow path extending from the entrance portion to one side of and around the valve axis, blending into the throat portion in a descending spiral about the valve axis, and

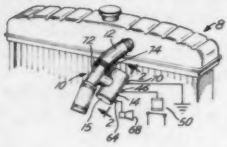
a movable wall in said port and extending along a major portion of said spiral, said movable wall being adjustable intermediate its ends between a first position of open area in said spiral portion and a second position of reduced area in said spiral portion, whereby the cross-sectional area of said portion of the inlet port spiral is variable to vary as desired the rate of flow and the level of mixture swirl created in the cylinder.

**4,381,744**

## FLUID TEMPERATURE MONITOR

**D. A. Terry, Bayles Lake, Loda, Ill. 60948, assignor to D. A. Terry, Loda, Ill.**

**Filed Dec. 8, 1980, Ser. No. 214,106**
**Int. Cl.³ F02B *77/08***
**U.S. Cl. 123—198 DC** **10 Claims**



1. A fluid temperature monitor for monitoring the temperature of a fluid comprising:

thermostat means operable in response to the temperature of the fluid,

warning means,

first switch means having first contacts which are actuated by said thermostat means to close and complete an electrical circuit to actuate said warning means when the temperature of said fluid reaches a predetermined level,

prime mover cutoff means,

second switch means having second contacts which are actuated by said thermostat means to close and complete an electrical circuit to actuate said prime mover cutoff means after said warning means has been actuated, and

means for bathing said thermostat means and said contacts directly in said fluid being monitored.

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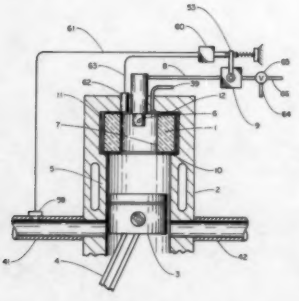
**4,381,745**

## POROUS BURNER DIESEL ENGINE

**Joseph C. Firey, P.O Box 15514, Seattle, Wash. 98115**

**Continuation-in-part of Ser. No. 138,988, Apr. 10, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,455**
**Int. Cl.³ F02B *45/10*; F02D *19/00***
**U.S. Cl. 123—294** **13 Claims**



1. A porous burner diesel engine comprising:

an internal combustion engine mechanism comprising cylinders, pistons operative within said cylinders, piston crowns on the compressing side of said pistons, and a combustion chamber space in each such cylinder fully enclosed by said piston crowns and a portion of the walls of said cylinder when said piston crowns and cylinder enclose the smallest such space during the engine compression process;

at least one porous burner volume in each of said cylinders, said burner volume being made from a porous, solid, high-temperature material, said porous burner volume being secured within said combustion chamber space and occupying a fractional portion thereof, said fractional portion being less than one and greater than zero;

means for spreading poured liquid fuel over interior surface areas of said porous burner volume so that, poured fuel is forced inside said porous burner volume during compression processes, gas or liquid can flow only into said porous burner volume during compression processes and can flow only out of said porous burner volume during expansion processes and cannot flow entirely through said porous burner volume, whereby unburned solid portions of said poured fuels are retained within said porous burner volume between engine cycles, said means for spreading comprising:

said porous burner volume comprising an external surface area consisting of two portions, a sealed area largely sealed to prevent gas or liquid flow therethrough during the engine compression and expansion processes, and an unsealed, poured upon area, through which gas or liquid flow can occur during the engine compression and expansion processes, all of said poured upon area for each burner volume being in contact with a single, undivided portion of said combustion chamber space;

means for pouring a volume of said liquid fuel upon a portion of said poured upon area, said pouring commencing after the commencement of the engine intake process for each engine cycle, said pouring being stopped prior to the end of the engine compression process for that same engine cycle;

means for controlling the quantity of liquid fuel poured upon the external surface of said porous burner volume during each engine cycle.

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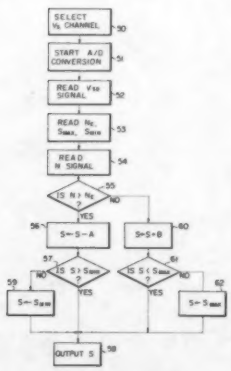
**4,381,746**

## METHOD OF CONTROLLING THE ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

**Hideo Miyagi, Toyota, and Jiro Nakano, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Continuation of Ser. No. 44,407, Jun. 1, 1979. This application Feb. 4, 1981, Ser. No. 231,397**
**Claims priority, application Japan, Jun. 17, 1978, 52-72725**
**Int. Cl.³ F02M *1/00*; G06F *15/20*; F02D *31/00, 1/04***
**U.S. Cl. 123—339** **5 Claims**




1. A method of controlling the idling rotational speed of an internal combustion engine having an intake passage and a throttle valve in the intake passage, said method comprising the steps of:

a. measuring the actual rotational speed of the engine and generating an actual speed signal corresponding thereto;

b. detecting the temperature of the engine and generating a

temperature signal that has a value corresponding to the detected temperature;

c. generating, in response to the temperature signal, a reference speed signal having a value which is a function of the value of the temperature signal and which represents the desired idling rotational speed of the engine at the detected temperature;

d. comparing the actual speed signal to the reference speed signal and generating a control output signal that corresponds to the flow rate of air drawn through the intake passage into the engine;

e. restricting the value of the control output signal to be between upper and lower limits which are functions of the detected temperature of the engine; and

f. controlling, in response to the restricted control output signal, the flow rate of air drawn into the engine through the intake passage to control the actual speed of the engine to reduce the magnitude of the difference between the actual speed signal and the reference speed signal.

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**4,381,747**

## IDLING SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

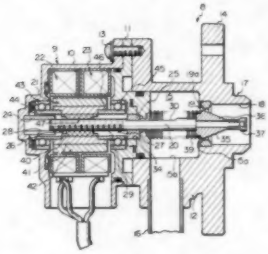
**Nobuyuki Kobayashi, Toyota; Hiroshi Itoh, Nagoya, and Hiromi Otsuki, Anjo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan**

**Filed Mar. 16, 1981, Ser. No. 244,115**

**Claims priority, application Japan, Dec. 8, 1980, 55-171973**

**Int. Cl.³ F02D** *11/10;* **F02N** *17/00*

**U.S. Cl. 123—339** **12 Claims**



1. An idling speed control device of an internal combustion engine having an intake passage and a throttle valve arranged in the intake passage, said device comprising:

a bypass passage interconnecting the intake passage located upstream of the throttle valve to the intake passage located downstream of the throttle valve;

valve means arranged in said bypass passage and having a valve chamber which has an air inlet opening and an air outlet opening, said air inlet opening being formed on an inner bottom wall of said valve chamber and connected via said bypass passage to the intake passage located upstream of the throttle valve, said valve means having a control valve for controlling a flow area of said air outlet opening which is connected to the intake passage located downstream of the throttle valve, and;

a stepper motor connected to said control valve for controlling the amount of air flowing within said bypass passage in accordance with a change in the operating condition of the engine at the time of idling, and

wherein said stepper motor includes a motor housing, a stator stationarily arranged in said motor housing, a rotor, and a valve shaft axially movable in said motor housing and actuated by said rotor, said control valve being fixed onto said valve shaft, and

wherein said rotor includes a hollow cylindrical outer body made of a permanent magnet, a hollow cylindrical inner body made of a synthetic resin and rotably mounted on said valve shaft and a hollow cylindrical intermediate body interposed between said hollow cylindrical inner and outer bodies and made of a metallic material, said hollow cylindrical intermediate body being supported on said motor housing by means of bearings.

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**4,381,748**

## METHOD OF REGULATING COMBUSTION IN THE COMBUSTION CHAMBERS OF AN INTERNAL COMBUSTION ENGINE

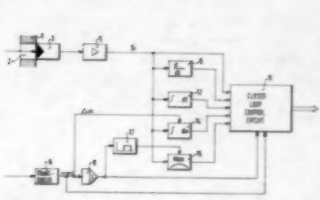
**Konrad Eckert, Stuttgart; Klaus Müller, Tamm; Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen; Franz Rieger, Aalen-Wasseralfingen; Winfried Moser, Markgröningen; Horst Franke, Löchgau, all of Fed. Rep. of Germany; Rainer Burkel, Le Chesnay, and Cornelius Peter, Paris, both of France, assignors to Robert Bosch GmbH, Fed. Rep. of Germany**

**Filed Jun. 18, 1981, Ser. No. 274,919**

**Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023014; Mar. 21, 1981, 3111135**

**Int. Cl.³ F02P** *5/04;* **F02M** *25/06, 51/02*

**U.S. Cl. 123—414** **29 Claims**



1. A method for regulating the combustion of metered operating substances to be delivered to the combustion chambers of an internal combustion engine using light signals arising in the combustion chamber as a control variable, comprising the steps of,

detecting the light intensity over the course of combustion;

differentiating a detected signal corresponding to the instantaneous light intensity in the combustion chamber;

developing in response thereto at least one characteristic point, such as maximum, turning point, point of increase, in the curve of the differentiated signal as a reference control variable with respect to the crankshaft angle position; and

triggering in response to the reference control variable a closed-loop control device of the internal combustion engine.

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**4,381,749**

## INTAKE DEVICE FOR ENGINE

**Keiichi Sugiyama, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Filed May 4, 1981, Ser. No. 260,036**

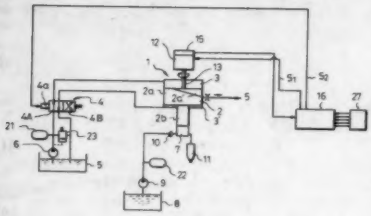
**Claims priority, application Japan, Feb. 21, 1980, 55-21142**

**Int. Cl.³ F02B** *29/02*

**U.S. Cl. 123—432** **10 Claims**

1. In an induction system for a variable volume chamber of an internal combustion engine comprising a main intake passage discharging into said chamber and an auxiliary induction passage formed at least in part by a pipe extending into the main intake passage and terminating contiguous to its point of discharge into the chamber and having an outlet communicating with said main intake passage contiguous to its point of discharge into said chamber, said auxiliary induction passage having a substantially smaller effective area than said main intake passage, the improvement comprising deflector means positioned at the outlet of said auxiliary induction passage for

redirecting the flow issuing therefrom, said deflector means comprising an integral end portion of said pipe configured to



direct the flow from the pipe in a direction other than along the axis of the pipe.

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**4,381,750**

**FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES**

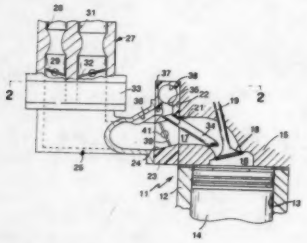
**Takeo Funada, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan**

**Filed Jul. 15, 1981, Ser. No. 283,519**

**Claims priority, application Japan, Jul. 24, 1980, 55-101947**

**Int. Cl.³ F02M** *51/00*

**U.S. Cl. 123—446** **3 Claims**



1. A fuel injection apparatus for use in an internal combustion engine, which comprises:

a piston housing;

a servo piston having a large size portion having opposite end-faces, and a small size portion having an end face remote from said large size portion, said large size portion defining a servo-pressure chamber and a counter-servo-pressure chamber between said opposite end faces thereof and associated inner surfaces of said piston housing, said small size portion defining a pump working chamber between said end face thereof remote from said large size portion and associated inner surfaces of said piston housing;

said servo piston having an outer peripheral surface thereof formed with a notch, said notch opening in an end face of said servo piston facing said servo-pressure chamber and having a base thereof extending obliquely to the axis of said servo piston, said piston housing having a peripheral wall thereof formed with a spill port communicating with a zone under lower pressure, said spill port being located for engagement with said notch;

injection nozzle means arranged in communication with said pump working chamber;

means for feeding operating fluid under pressure to said servo-pressure chamber and to said counter-servo-pressure chamber;

selector valve means connecting said servo-pressure chamber and said counter-servo-pressure chamber to said operating fluid pressure feed means and being changeable in valve position to allow operating fluid to be alternately supplied from said operating fluid pressure feed means to said servo-pressure chamber and to said counter-servo-pressure chamber;

means for feeding fuel under pressure to said pump working chamber, said fuel pressure feed means being provided separately from and independently of said operating fluid pressure feed means;

actuator means connected to said servo piston for rotating same; and

means coupling said servo piston to said actuator means in a manner allowing free axial displacement of said servo piston but forcing rotation thereof in unison with said actuator means;

whereby rotation of said servo piston to change a circumferential position thereof through said actuator means causes a change in the compression stroke of said servo piston to thereby achieve control of the injection quantity of fuel through said injection nozzle means, while achieving control of the timing of injection beginning of fuel through said injection nozzle means by changing the timing of change of the valve position of said selector valve means.

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**4,381,751**

**FUEL INJECTION SYSTEM**

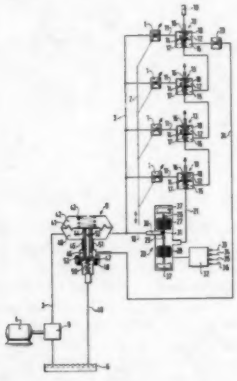
**Wolfgang Maisch, Schwieberdingen; Jürgen Peters, Affalterbach; Michael Wissmann, Gerlingen; Karl Gmelin, Ingelfingen, and Peter Stiefel, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 20, 1981, Ser. No. 236,382**

**Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006586**

**Int. Cl.³ F02M** *39/00*

**U.S. Cl. 123—454** **12 Claims**



1. A fuel injection system for mixture-compressing internal combustion engines having externally-supplied ignition, said system further including metering valves disposed in a fuel supply line for metering a quantity of fuel in a predetermined ratio to the quantity of air aspirated by the engine, said metering being effected at a constant pressure difference variable in accordance with operating characteristics of said engine, said system further including a regulating valve having a movable valve element disposed downstream of each metering valve and arranged to regulate pressure differences at each metering valve, said regulating valve further arranged to be exposed on the one hand to fuel pressure downstream of the respective metering valve and on the other hand to the pressure in a control pressure line, the pressure in said line being further limited on the one hand by a control pressure valve and on the other hand by a control throttle, characterized in that an elec-

tro-fluid converter means of the nozzle/bounce plate type serves as said control pressure valve and is triggerable by an electronic control device in accordance with engine characteristics, said electro-fluid converter means dividing said control pressure line from said fuel supply line, and said control throttle limiting the pressure in said control pressure line downstream of said regulating valves.

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**4,381,752**

## COMBINED IGNITION CONTROL AND FUEL INJECTION VALVE OPERATING CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

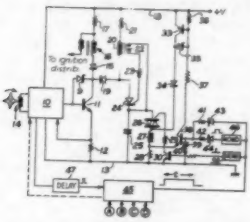
**William F. Hill, Stafford, England, assignor to Lucas Industries, Ltd., Birmingham, England**

**Filed Apr. 22, 1981, Ser. No. 256,537**

**Claims priority, application United Kingdom, May 1, 1980, 8014494**

**Int. Cl.³ F02B *3/00*; F02M *51/00*; F02B *3/10***

**U.S. Cl. 123—475** **9 Claims**



1. A combined ignition control and fuel injection valve solenoid operating circuit comprising:

an ignition control circuit, said circuit including a first semiconductor switch element means for controllably interrupting current flow in an ignition coil;

an energy storage element;

an inductive means, responsive to said switch element means interrupting current flow in an ignition coil, for storing electrical energy in said energy storage element; and

injection valve solenoid control means for energizing an injection valve solenoid, said control means including means for connecting said energy storage element to said injection valve solenoid when said control means energizes said injection valve solenoid.

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**4,381,753**

## EVAPORATIVE EMISSION CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE FOR VEHICLE USE

**Teruo Yuzawa, Oomiya, and Masaaki Uchida, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 6, 1980, Ser. No. 204,620**

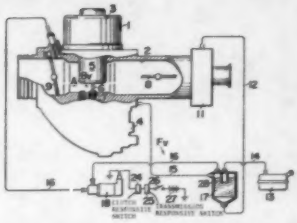
**Claims priority, application Japan, Nov. 12, 1979, 54-156698[U]**

**Int. Cl.³ F02M *33/02***

**U.S. Cl. 123—520** **11 Claims**

1. In an evaporative emission control device of an internal combustion engine for vehicle use having a variable venturi type carburettor which includes an intake passage formed in a carburettor body, a venturi valve in said intake passage for variably adjusting an opening area of a venturi formed in said intake passage, and a throttle valve in said intake passage downstream of said venturi valve to control the amount of air-fuel mixture flowing in said intake passage,

the improvement comprising a fuel vapor supply port opening in said intake passage at a location between said venturi valve and said throttle valve for supplying fuel vapor to said intake passage, said port being upstream of said throttle valve for all positions of the throttle valve, a fuel vapor storage canister for storing fuel vapor from a fuel vapor source, a fuel vapor purge line interconnecting said canister and said supply port for supplying fuel vapor purged from said canister to said supply port and valve means disposed in said purge line for controlling the flow



of fuel vapor purged from said canister, said valve means being adapted to open when a transmission device interposed in a power transmission system which interconnects said internal combustion engine and driving wheels of the vehicle is in a power transmitting position.

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**4,381,754**

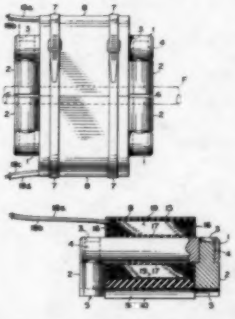
## ELECTROMAGNETIC FUEL SAVING DEVICE

**Karl Heckel, 1515 Ward Ave., Apt. 1403, Honolulu, Hi. 96822**

**Filed Sep. 14, 1981, Ser. No. 302,211**

**Int. Cl.³ F02M *27/00***

**U.S. Cl. 123—538** **8 Claims**

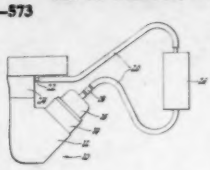


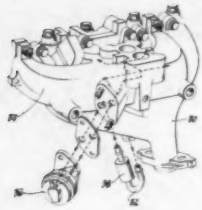
1. An electromagnetic fuel saving device for an internal combustion engine comprising an electromagnetic assembly which includes a coil, a spool, a coil winding insulating tape, a casing, a core, two studs, and two terminals; the coil is wound around the cylinder of the spool and within its rims; the insulating tape covers the coil; the casing encloses the coil, the insulating tape, and the spool; the casing has a concave end portion; the core is pivotally mounted within the spool cylinder, has two spaced holes located in its end portions, and extends on either side of the spool a distance slightly greater than the width of the stud; the stud has a reduced end portion and a concave end portion and its reduced end portion fits within the hole of the core; the casing is formed so that its concave end portion extends slightly beyond the concave end portion of the stud; and the terminals are connected to the coil and are adapted to be used to operatively connect the coil to a battery.

## 4,381,755
## PROTECTING CATALYST FROM PHOSPHORUS POISONING

**Frank Caracciolo, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 8, 1980, Ser. No. 176,472**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—573** **4 Claims**





1. A method of protecting the catalyst materials in a catalytic converter vehicle emissions control system from the poisoning effect of phosphorus, said converter being located in the exhaust path of an internal combustion engine, comprising contacting at least one engine gas stream selected from the crankcase ventilation stream and the exhaust gas recirculation stream with a bed of solid adsorbent capable of removing phosphorus and phosphorus compounds in said gas stream, and circulating said treated gas stream to the intake side of the engine, the phosphorus content of said exhaust stream being reduced by absorption from that present in the absence of said solid adsorbent treatment said bed being heated principally only by the stream being treated.

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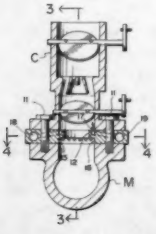
## 4,381,756
## GASOLINE ECONOMIZING ATTACHMENT DEVICE FOR INTERNAL COMBUSTION ENGINES

**Gerhard Waschkuttis, North Miami Beach, Fla., assignor to Walter Mundorf, Sieburg, Fed. Rep. of Germany, a part interest**

**Filed Oct. 31, 1980, Ser. No. 202,893**
**Int. Cl.³ F02M *33/02***
**U.S. Cl. 123—591** **4 Claims**



1. A gasoline economizing attachment device for internal combustion engines comprising, in combination, a substantially flat housing member adapted for insertion between the exit port of a gasoline carburetor and the intake port of the intake manifold of a gasoline combustion engine, said housing member having a central through opening for coaxial connection between the carburetor and the intake manifold for carbureted fuel flow therethrough, a raw gasoline collection recess about the inner periphery of said housing through opening, flow path communicating means between said annular recess and a plurality of openings below said annular recess, said flow path communicating means comprising a first plurality of bores in said housing and communicating between said annular recess and a through bore in said housing, a second plurality of bores opening at one end into said central housing through opening below said annular housing recess, said flow path communicating means further including an external length of tubing communicating between one end of said through bore and the inner ends of said second plurality of bores, said flow path communicating means further comprising a vaporizing chamber in said external length of tubing adapted to collect excess raw gasoline, and a nozzle within said vaporizing chamber directing a stream of the vacuum-moved air against the surface of said excess collected raw gasoline for inducing the vaporization thereof in said flow path communicating means, and means controlling the volume of air being drawn into said through bore at the other end thereof under the influence of vacuum applied at said central through opening in said housing member during the operation of the internal combustion engine, whereby raw gasoline collected in said annular recess will be admixed with air in said flow path communicating means for the vaporization thereof and reintroduction as gaseous fuel through said plurality of openings.

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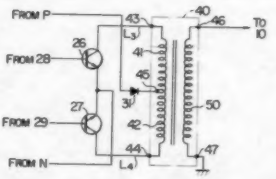
## 4,381,757
## CONTINUOUS TYPE IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

**Seiji Morino, Aichi; Hisasi Kawai, Toyohashi, and Norihito Tokura, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Jul. 24, 1980, Ser. No. 171,760**
**Claims priority, application Japan, Jul. 30, 1979, 54-96985**
**Int. Cl.³ F02P *5/04***
**U.S. Cl. 123—606** **3 Claims**




1. An ignition device comprising:
a transformer having a core which is formed with an air gap therein, and primary and secondary coil means wound around said core;
said primary coil means including a primary coil having a center tap which provides a neutral point for said primary coil means;
a DC power source having a pair of output terminals;
an oscillator circuit for generating periodic pulses;
means for inverting said periodic pulses;
a pair of transistors in push-pull connection, one of said transistors having a base coupled to receive said periodic pulses and the other a base coupled to receive the inverted periodic pulses, said transistors having emitters connected with one of said output terminals of said DC power source, and having collectors connected with respective end terminals of said primary coil means; and
a single diode connected from said neutral point to the other output terminal of said DC power source;
whereby high trigger voltages and continuous discharge

voltages are generated periodically in said secondary coil when said transistors in push-pull connection are turned on and off in response to said pulses.

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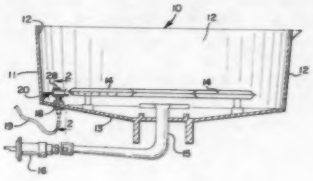
**4,381,758**

## IGNITOR CHAMBER FOR GAS GRILL

**James J. Svekis, Thornhill, and John Janez, Scarborough, both of Canada, assignors to Shepherd Products Limited, Canada**

**Filed Jul. 20, 1981, Ser. No. 285,386**
**Int. Cl.³ F24C 3/00**
**U.S. Cl. 126—41 R** **2 Claims**



1. An ignitor for a gas barbecue grill having a gas burner and means for supplying gas to the burner, a collector box mounted in the grill in association with said burner, said box having an open mouth facing the burner for admitting gas emanating from the burner, said open mouth being of greater area that the rear wall of the collector box with the box having a flaring shape to facilitate movement of gas from the burner into the collector box, an ignition device adapted to ignite said gas mounted in the grill and extending into said box, said box provided with a cupola comprising a generally rectangular vault formed integrally with a top wall of said collector box and extending above the top wall, and vent openings in opposite sides of the vault, said ignition device being located directly under the area of said cupola and strikes a spark in said area.

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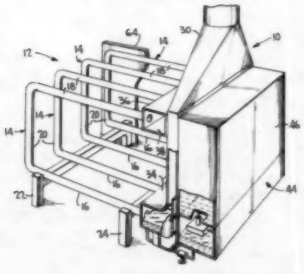
**4,381,759**

## FIREPLACE HEAT EXCHANGER APPARATUS AND METHOD

**Carlo Faustini, 13020 Tamarack Rd., Silver Spring, Md. 20904**

**Filed Jul. 10, 1980, Ser. No. 167,368**
**Int. Cl.³ F24B 7/00; F24F 3/14**
**U.S. Cl. 126—121** **18 Claims**



1. Heat exchanger apparatus for use in a fireplace to heat a space, said apparatus comprising:

a tubular grate for holding fuel to be burned, said tubular grate comprising plural hollow tubes each having a hollow interior with a bottom portion adapted to contain liquid to be heated and vaporized by the burning of the fuel held by the grate such that there is an exposed surface of the liquid contained in the grate interior, said grate interior being further adapted to flow pre-heated air to be further heated by the burning of the fuel held by the grate through the grate interior in parallel through said hollow tubes and in direct contact with said exposed liquid surface such that the flowing air which is heated in said grate entrains liquid vapor from the exposed liquid surface;

means for pre-heating and supplying air to said hollow interior of said plural hollow tubes in parallel, said pre-heating means including a supply flow path disposed above said grate so as to be heated by combustion products from said fuel;

means for expelling the heated air and the entrained liquid vapor from the grate into said space; and

liquid supply means for feeding a liquid to said bottom portion of said grate interior.

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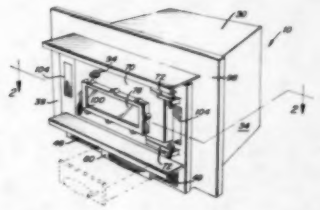
**4,381,760**

## FIREPLACE INSERT WITH FORCED AIR FLOW HEAT EXCHANGER

**James C. Reges, Rte. 3, Box 208, Rocky Mount, N.C. 27801**

**Filed Sep. 23, 1980, Ser. No. 189,745**
**Int. Cl.³ F24B 7/00**
**U.S. Cl. 126—123** **5 Claims**



1. A fireplace insert having an inner firebox including inner bottom, top, rear and opposite side walls interconnected along adjacent marginal edge portions to form a combustion chamber therein, an outer housing for snug reception within a fireplace, said housing including outer bottom, top, rear, front and opposite side walls, said firebox being received within said housing with the front thereof closed by the front wall of said housing and at least major portions of said inner bottom, top, rear annd opposite side walls spaced inwardly from opposing portions of said outer bottom, top, rear and opposite side walls, means dividing the space between said inner and outer bottom walls into a central front-to-rear extending ash pit closed at its rear end from the space between said inner and outer rear walls and a pair of opposite side front-to-rear extending air passages closed along their upper portions from the side spaces thereabove defined between corresponding inner and outer side walls of said firebox and housing and opening rearwardly into the rear space between said inner and outer rear walls, said inner bottom wall having an opening formed therein opening downwardly into said ash pit and equipped with a grate, said front wall having a lower central opening formed therein registered with the front end of said ash pit, an ash drawer slidably received in said ash pit for removal through and removably closing said lower central opening, an access opening formed in said front wall above said lower central opening for providing access to the interior of said combustion chamber through said front wall, an access door removably closing said access opening, the rear ends of said side spaces being closed from said rear space and open to the upper space between said top walls, means closing the forward portion of the upper space between said top walls and defining a flue gas outlet opening upwardly from said firebox through a forward portion of said housing top wall, air outlet means opening forwardly through said front wall on opposite sides of said access opening from the forward portions of said side spaces, air pump means operatively associated with said air passages for pumping air therethrough into the opposite side lower portions of the rear space between said rear walls, from the upper portions of said

rear space into the rear portion of said upper space, from opposite sides of said upper space down into the upper portions of said side spaces and forwardly from the latter through said air outlet means.

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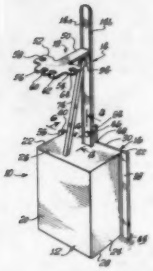
**4,381,761**
**ASH REMOVING APPARATUS**
**Benjamin F. Foxen, 5735 Pegasus Dr., Sun Valley, Nev. 89431**
**Filed Apr. 24, 1981, Ser. No. 257,206**
**Int. Cl.³ F23J 1/00**
**U.S. Cl. 126—243** **5 Claims**



1. An apparatus for removing, storing and transporting ash from a fireplace or stove which comprises: an ash or residue storing means having a handling means attached thereto and provided with a slideable closure across an open end of said storing means in which said closure has an extension projecting from one end thereof proximate said handling means; an indexing means affixed to said projecting extension which cooperates with first and second openings in said handling means said first opening located at the lower end of said handling means and said second opening located at an upper end of said handling means; approximately a distance necessary for allowing said closure to be moved into a position for exposing said opening of said residue storing means.

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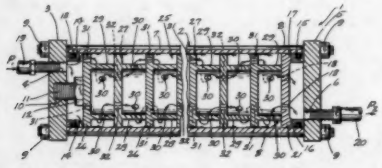
**4,381,762**
**FRICTION FURNACE**
**Arnold E. Ernst, Wolverton, Minn. 56594**
**Filed Nov. 3, 1980, Ser. No. 203,467**
**Int. Cl.³ F24C 9/00**
**U.S. Cl. 126—247** **5 Claims**



1. A friction furnace comprising:
a casing, including an input endcap including a fluid inlet and an output endcap including a fluid outlet;
a plurality of orifice plates disposed within said casing, each of said orifice plates being in peripheral, non-sealing contact with said casing and having an annular ring disposed radially inward from the periphery of said orifice plate, said annular ring containing a plurality of radially disposed passages therethru; and
an adjusting means for varying the number of said orifice plates contained within said casing, said adjusting means including:
an adjusting assembly including an adjusting nut and a threaded spacer threadably connected to said inlet endcap;
an adapter plate having an annular ring disposed at its periphery and containing a plurality of transverse passages disposed between its annular ring and its centerpoint, said adapter plate being disposed within said casing such that its annular ring is in contact with said outlet endcap.

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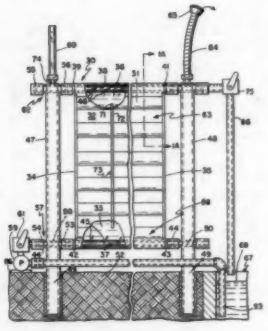
**4,381,763**
**LOW COST, LOW PRESSURE, SOLAR HEATED FENCE SURROUNDING A SWIMMING POOL**
**Karl H. Kahl, 8 Brian Rd., Chelmsford, Mass. 01824**
**Continuation-in-part of Ser. No. 116,295, Jan. 28, 1980, abandoned, which is a continuation of Ser. No. 894,401, Apr. 7, 1978, abandoned. This application Jul. 27, 1981, Ser. No. 286,773**
**Int. Cl.³ F24J 3/02**
**U.S. Cl. 126—416** **2 Claims**

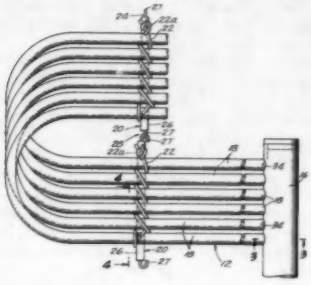


1. A combination fence and solar heater for swimming pools, of the type having a plurality of vertical fence posts and hollow fence panels forming a continuous fence around the periphery of the pool, said panels having interior chambers interconnected with each other and with the water in the pool to form a water carrying passageway from the pool, through said chambers, and back to the pool and having a water pump for circulating pool water around said passageway for warming by the heat of the sun, characterized by:
said fence panels and fence posts being in substantially the same vertical plane, with each panel supported in the space between a pair of adjacent posts;
each said fence panel comprising a pair of closely spaced, corrugated, plastic sheets, of relatively broad area, peripherally joined along the edges, with the ribs and grooves of one sheet normal to the ribs and grooves of the other sheet so that the interior chamber therein is thin, free of obstruction to vertical flow and of relatively wide area;
cross bracing means between said sheets for preventing bulge thereof under water pressure;
a flow control valve mounted between said pump and said fence panels for establishing pressure at no more than about 3 psi and rate at no more than about 60–70 gallons per hour per panel;
a back pressure valve mounted between said fence and said pool for assuring substantially even flow to all panels of said fence;
and an open air and water riser pipe connected to said water carrying passageway at the top of a panel to prevent build-up of destructive pressures tending to bulge said panels.

## 4,381,764
## SOLAR PANEL

Warren Wojcik, 527 N. Main St., Fallbrook, Calif. 92028

Filed Mar. 20, 1980, Ser. No. 132,311
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 4 Claims



1. A solar panel for heating a fluid medium by solar radiation, comprising:

(a) first and second spaced apart header members, each said header member having side walls defining a central passageway extending longitudinally of said member;

(b) a plurality of transversely spaced apart conduit receiving and gripping means formed in each of said header members, each conduit receiving and gripping means comprising a tapered aperture formed in said walls of said header members, each said aperture having sloping side walls tapering from a major diameter opening to a smaller minor diameter opening;

(c) a plurality of elongated, flexible fluid carrying conduits extending between said first and second header members, one end of each said conduit being sealably received in one of said conduit receiving and gripping means formed in said first header member and the other end of said conduit being sealably received in one of said conduit receiving and gripping means formed in said second header member, said conduits being formed of a compressible material and being slightly larger in diameter than said minor diameter openings formed in said walls of said header member, whereby when the ends of said conduits are forced into said apertures said conduits will be compressed radially inwardly to form a fluid tight seal between said conduit and said header without requiring the use of a bonding agent;

(d) securing means disposed at a plurality of locations between said first and second header members for securing together said conduits and retaining them in a fixed, transversely spaced apart relationship to form an elongated panel assembly of a predetermined width, said securing means being sufficiently spaced apart longitudinally of said assembly to permit said assembly, at various locations along its length, to be rolled back upon itself to form a plurality of substantially coplanar, oppositely extending sections disposed in side by side relationship, said securing means comprising:

(i) an elongated, rigid member adapted to extend transversely of said panel assembly; and

(ii) a flexible lacing adapted to alternately pass under said rigid member and over each of said conduits to secure said conduits to said rigid member and retain them in a fixed, transversely spaced apart relationship with respect to one another;

(e) interlocking means associated with said securing means for interlocking together said oppositely extending sections of said panel assembly to prevent relative movement between said adjacent section; and

(f) means for circulating fluid through said panel assembly.

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## 4,381,765
## ILEOSTOMY VALVE

Thomas A. Burton, Rochester, Minn., assignor to Waters Instruments, Inc., Rochester, Minn.

Filed Apr. 2, 1981, Ser. No. 250,231
Int. Cl.³ A61B 19/00
U.S. Cl. 128—1 R 10 Claims

1. An ileostomy valve connectable to the stoma of a patient for controlling continence, and including

a drainage tube having an inner end portion insertable within the stoma of a patient and having a flexible outer end portion, the tube being free of internal obstructions interfering with the free flow of bowel contents from the valve;

securing means carried by the inner end portion for securing the latter to the stoma deep to the facia;

means for releasably sealing the outer end portion of the drainage tube and comprising means carried by the tube exterior of the patient for releasably shaping the flexible outer end portion of the drainage tube in a bent collapsed orientation to seal the tube and means retaining and carrying said tube in said bent orientation flatly adjacent the skin of a patient.

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## 4,381,766
## BACK APPLICATOR

Anita M. Avolio, 214 Bull Run Rd., Trenton, N.J. 08638

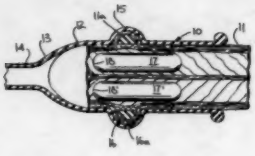
Filed Sep. 19, 1980, Ser. No. 188,958
Int. Cl.³ A61H 7/00; A61M 35/00
U.S. Cl. 128—62 R 2 Claims

1. An applicator for applying lotions to portions of the body that are difficult to reach comprising: an elongated handle which is bilaterally symmetrical about one plane, having a proximal portion adapted to be grasped by an operator's hand, and a curved distal portion which extends from the proximal portion and terminates at an applicator end; a pad housing connected to said applicator end of the distal portion of the handle; a fastening means attached to the pad housing; said fastening means comprising one of a first and second element, said first element comprising a series of hooks, said second element comprising a series of loops; said handle comprising two parts which are pivotally connected to fold about an axis which is parallel to said plane and including means for releasably locking the two parts in aligned relationship.

## 4,381,767
## PENILE IMPLANT

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Jul. 15, 1980, Ser. No. 169,174
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 4 Claims



1. A method of modifying the penis of an incontinent male patient so that a flexible elastic sheath of a urinary collection device will be retained thereon which comprises surgically implanting underneath the penil skin a ring of biocompatible material having a Shore A hardness of about 10 to produce a protuberance which effectively increases the diameter of the penis so that the flexible elastic sheath of the urinary collection device is more securely retained.

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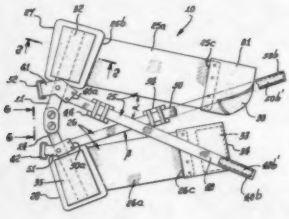
## 4,381,768
## KNEE ORTHOSIS

Charles W. Erichsen, Covina, and Michael A. Bleemers, San Dimas, both of Calif., assignors to Stainless Mfg., Inc., San Dimas, Calif.

Filed May 18, 1981, Ser. No. 264,689
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 C 7 Claims



1. In a knee orthosis, the combination comprising
(a) a first elongated rigid member attachable to the outer side of the upper leg while extending generally in the direction thereof,
(b) a second elongated rigid member attachable to the outer side of the lower leg while extending generally in the direction thereof,
(c) means pivotally coupling said members, proximate the knee location,
(d) inter-meshed gear parts respectively carried by said members to relatively rotate as either of said members pivots relative to the other of said members,
(e) first straps on and spaced along the first member and adapted to be wound about at least the upper leg, and second straps on and spaced along the second member and adapted to be wound about at least the lower leg, whereby the first and second members are held in position relative to the upper and lower legs with the gear parts located laterally proximate the knee location, and
(f) pads on said members and shaped to fit against said upper and lower legs, at least two of said first and second straps associated with said pads to hold the pads in place,
(g) said first straps including a relatively wide first strap having an end anchored to said first member and an opposite end adapted to wind about the upper leg, and said second straps including a relatively wide second strap having one end anchored to said second member and an opposite end adapted to wind about the lower leg,
(h) said first straps including a relatively narrow primary strap having one end anchored to said upper member so as to extend at an angle to said wide first strap, and having a free opposite end adapted to wind about the rear of the knee for connection to the lower member,
(i) said one end of the narrow primary strap anchored closer to said gear parts than said end of the wide first strap, said lower member having a connection thereon for receiving said free opposite end of the primary strap, said connection located closer to the gear parts than said end of the wide second strap,
(j) said second straps including a relatively narrow secondary strap having one end anchored to said lower member so as to extend at an angle to said wide second strap, and having a free opposite end adapted to wind about the rear of the knee for connection to the upper member,
(k) said one end of the narrow secondary strap anchored closer to said gear parts than said end of the wide second strap, said upper member having a connection thereon for receiving said free opposite end of the secondary strap, said connection located closer to said gear parts than said end of the wide primary strap,
(l) whereby when said one ends of the primary and secondary straps move relatively toward one another as said gear parts relatively rotate, said opposite ends thereof move relatively apart.

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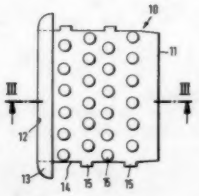
## 4,381,769
## PROTECTIVE ELEMENT FOR PRODUCING THE CLOSURE EDGES OF PLASTER BANDAGES ON THE HUMAN BODY, AND A PLASTER BANDAGE MADE USING SUCH PROTECTIVE MEMBER

Jan Prahl, Rullstorf, Fed. Rep. of Germany, assignor to IPOS Gesellschaft für integrierte Prothesen-Entwicklung und orthopadietechnischen Service mbH & Co. KG, Lüneburg, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 294,973
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031668
Int. Cl.³ A61F 5/04
U.S. Cl. 128—91 R 2 Claims



1. In a plaster bandage, a protective element for making the closure edges of the plastic bandage on a human body, comprising an axially extending sleeve-like flexible sectional element having an inside surface and an outside surface, said sectional element having a folded-over closure formed on one of the end edges thereof with said closure projecting outwardly from the outside surface of said sectional element, said closure extends for a slight length of said sectional element and has an arc-shaped surface extending outwardly from the outside surface of said sectional element with said arc-shaped surface having a convex surface facing in the opposite direction away from the opposite end of said sectional element and a concave surface facing in the direction toward the opposite end of said sectional element, said sectional element having a

plurality of knob-like engagement sections formed thereon with said engagement sections projection outwardly from the outside surface of said sectional element, said sectional element is formed of a cross-linked toxicologically harmless silicone rubber, and the outside surface of said sectional element tapers inwardly toward the inside surface at the opposite end from the end forming said closure.

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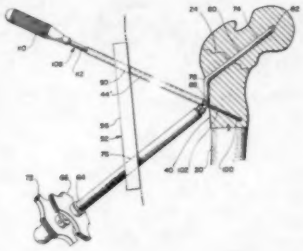
**4,381,770**

## METHOD AND APPARATUS FOR PERFORMING PERCUTANEOUS BONE SURGERY AND NEW PIN IMPLANT

**Alonzo J. Neufeld, 1650 N. Parway Dr., Glendale, Calif. 91206**

**Filed Oct. 26, 1981, Ser. No. 315,238**
**Int. Cl.³ A61F *5/04;* A61B *17/18***
**U.S. Cl. 128—92 BA** **10 Claims**



1. For performing percutaneous bone surgery and aid the healing of a fracture, an elongated tubular guide adapted to be inserted through a small skin surface and tissue incision and positioned at a predetermined angle to the axis of the femur bone with an end abutting said bone and its exterior end remaining outwardly of said skin surface, said guide serving to direct a drill bit to said bone and assuring proper angular direction to form a first bore in said bone when said drill bit is activated, the combination of:

a pin means having one forward straight portion with a first axis for insertion in said first bore and a second short rear extension portion having a second axis approximately 145° to said first axis, and a bore extending through said second short rear extension portion;

a pin insertion means including pin gripping means to releasably hold said pin wherein said pin insertion means has a portion for entering said incision to place said forward straight portion by friction in said bore whereby said short rear extension is adapted to abut and be parallel to said femur leg bone;

a second tubular guide for inserting through a small skin surface and tissue second incision above said first incision and at an angle thereto aligned with and abutting said bore in said pin;

adjustable linking means securing said pin insertion means and said second tubular guide in a predetermined angular relationship;

said second tubular guide serving to direct a second drill bit through said bore to form a second bore in said bone when said drill bit is activated;

a fastening means with a tool interlock means at a rearward end inserted in said second bore to secure said pin to said femur; and

a tool having a complimentary interlock means with said fastening means slidably inserted into said second guide to engage said fastening means.

**4,381,771**

## FEMALE CONTRACEPTIVE

**Shlomo Gabbay, Hartsdale, N.Y., assignor to Kedma, Incorporated, Hartsdale, N.Y.**

**Continuation-in-part of Ser. No. 174,224, Jul. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 950,162, Oct. 10, 1978, abandoned, which is a continuation of Ser. No. 764,765, Feb. 2, 1977, abandoned. This application Dec. 21, 1981, Ser. No. 333,049**
**Int. Cl.³ A61F *5/46***
**U.S. Cl. 128—129** **34 Claims**

1. A female contraceptive device comprising in combination a generally toroidal outwardly expandable collar having an internal wall whose diameter is of sufficient size to surround the cervix and an external wall having an expanded diameter greater than the internal diameter of the vagina in the vicinity of the cervix, whereby said collar when positioned about the cervix is held in place by the pressure of said collar against the vagina and substantially fills the posterior and anterior fornices of the vagina, a hollow body portion integrally attached at its upper end to and depending from said collar below the cervix, and valve means extending downwardly from the lower end of said body portion to permit secretions to pass outwardly therefrom while preventing external entry thereto.

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**4,381,772**

## BIOERODIBLE DIAPHRAGM

**Fernando G. Guistini, 22 Boxwood Cir.; Frank J. Keefer, 7 Dawn Ree Acres, both of Wheeling, W. Va. 26003, and Robert F. Keefer, 1276 Colonial Dr., Morgantown, W. Va. 26505**

**Filed Nov. 20, 1980, Ser. No. 208,569**
**Int. Cl.³ A61F *5/46***
**U.S. Cl. 128—132 R** **6 Claims**

1. A contraceptive vaginal diaphragm composed of a bioerodible matrix which disintegrates in the vaginal fluids within a selected predetermined period of time between 30 minutes to 30 hours, said matrix being made from a water soluble gel.

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**4,381,773**

## METHOD AND NOZZLE FOR NASAL VACCINATION OF IMMATURE MAMMALS

**Robert A. Goodnow; Floyd J. Shade; Thomas A. Sloboth, and Donald J. Kaye, all of Omaha, Nebr., assignors to Schering Corporation, Kenilworth, N.J.**

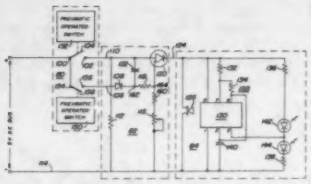
**Continuation of Ser. No. 161,997, Jun. 23, 1980, Pat. No. 4,300,545. This application Aug. 10, 1981, Ser. No. 291,715**
**The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.**
**Int. Cl.³ A61D *7/00***
**U.S. Cl. 128—200.14** **11 Claims**

1. A method of safely and effectively vaccinating a mammal having an alar fold comprising the steps of:

a. inserting into a nostril of the mammal a nozzle having a tip,

b. pushing the mammal's alar fold aside with said tip,

c. dispensing a preselected amount of vaccine from a container through said nozzle while the alar fold is pushed



aside by said tip such that vaccine is deposited behind the alar fold, and

d. withdrawing the nozzle from the nostril of said mammal.

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**4,381,774**

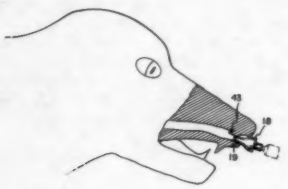
## SAFETY SYSTEM FOR BREATHING APPARATUS

**Peter J. Schreiber, Box 74, R.D. 1, Zionsville, Pa. 18092, and Joachim G. M. Schreiber, Babcock Tower Apartments, Apt. 6-D, 270 Babcock St., Boston, Mass. 02215**

**Continuation-in-part of Ser. No. 86,196, Oct. 18, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,283**

**Int. Cl.³ A61M *17/00***

**U.S. Cl. 128—202.22** **9 Claims**



**1.** In an anesthesia apparatus having a breathing circuit gas supply means and rebreathing means comprising alternately selectable powered ventilator means and rebreathing bag means and means for selecting said rebreathing means, said apparatus being arranged for supplying gas to a spontaneously breathing patient using said bag means during first mode of operation or to artificially ventilate said patient by manually squeezing said bag means during a second mode of operation or to artificially ventilate said patient automatically by said powered ventilator during a third mode of operation, said bag means being selected by said selecting means during either said first or second mode of operation, said powered ventilator means being selected by said selecting means during said third mode of operation, said gas supply means and said selected rebreathing means being connected together by said selecting means for enabling gas from said supply means and from said selected rebreathing means to flow together at a first point, conduit means coupled to the lungs of a patient, inspiratory valve means connected to said gas supply and said selected rebreathing means for enabling gas from said first point to flow downstream through said conduit means to said lungs, expiratory valve means coupled between said conduit means and said rebreathing means for enabling gas to flow downstream from said lungs through said conduit means to said selected rebreathing means, and pressure relief means for venting gas out of said selected rebreathing means, the improvement comprising a safety system comprising alarm means and monitoring means comprising first pressure responsive switch means for monitoring gas pressure downstream of said first point and for establishing a first threshold pressure in excess of pressures normally encountered during spontaneous breathing but below a level at which patient injury could occur, second pressure responsive switch means for monitoring gas pressure downstream of said first point and for establishing a second threshold pressure greater than or equal to said first threshold pressure but below a level at which patient injury could occur, said first pressure responsive switch means enabling said alarm means only if the pressure monitored exceeds said first threshold pressure, said alarm means, when enabled, being responsive to said second pressure responsive switch means for providing an alarm signal only in the event that the pressure monitored exceeds said second threshold pressure for a predetermined period of time, in all three modes of operation of said apparatus, said first pressure responsive switch means disabling said alarm means whenever the pressure monitored is below said first threshold pressure.

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**4,381,775**

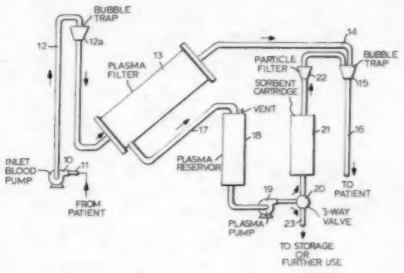
## METHOD FOR LOW PRESSURE FILTRATION OF PLASMA FROM BLOOD

**Yukihiko Nose', Cleveland Heights, and Paul S. Malchesky, Painesville Township, Lake County, both of Ohio, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 118,677, Feb. 5, 1980, abandoned. This application Aug. 18, 1980, Ser. No. 179,224**

**Int. Cl.³ A61M *5/00***

**U.S. Cl. 604—6** **6 Claims**




**1.** A method of separating plasma from whole blood, comprising the step of:

directing a flow of whole blood across one face of a filtration membrane means which is made of a material suitable for separating plasma from whole blood and having a pore size from 0.1 to 0.6 microns, said flow being at a flow velocity of from 5 to 1500$^{cm}$/min and being at a depth sufficient for separating plasma from the flow of blood, and at the same time generating a positive pressure differential across said membrane up to just below 50 mm Hg. for forcing plasma through the membrane, and collecting the plasma separated by the membrane.

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**4,381,776**

## ANTICOAGULANT DISPENSING APPARATUS AND METHOD OF USE

**Allen Latham, Jr., Jamaica Plain, Mass., assignor to Haemonetics Corporation, Braintree, Mass.**

**Continuation-in-part of Ser. No. 161,285, Jun. 20, 1980, abandoned. This application Apr. 14, 1981, Ser. No. 254,078**

**Int. Cl.³ A61J *1/00*; A61M *5/00***

**U.S. Cl. 604—317** **11 Claims**

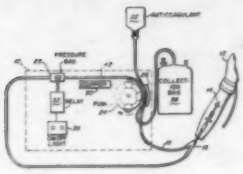
**1.** A blood collection set, comprising:

a. an anticoagulant solution in a first rigid container impermeable to water vapor and sterilant;

b. a blood receiving container;

c. a second container, permeable to said sterilant, surrounding said first container;

d. conduit means interconnecting said second container and said bag; and



e. rupture means for rupturing the first container so that the anticoagulant solution may flow from said first container through the conduit means connecting the second container and said bag.

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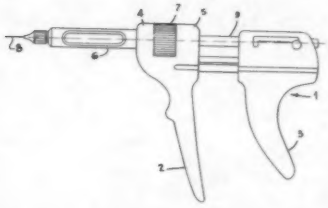
**4,381,777**

**SYRINGE WITH OSCILLATING NEEDLE**

**Marcel Garnier, Besancon, France, assignor to Micro-Mega S.A., Besancon, France**

**Filed Jan. 13, 1981, Ser. No. 225,181**
**Claims priority, application France, Jan. 14, 1980, 80 00942**
**Int. Cl.³ A61M 5/18**
**U.S. Cl. 604—188** **5 Claims**



1. In a syringe for injecting an anaesthetic or other liquid comprising a container for such liquid, a needle, and handle means responsive to pressure of the handle to cause liquid to be ejected from the needle and a manually rotatable wheel for rotating said needle, the improvement comprising power means for driving said wheel in oscillating back and forth rotation so as to effect back and forth oscillation of the needle about its axis during the injection operation.

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**4,381,778**

**NEEDLE-LOADING MULTIPLE BARREL SYRINGE**

**George Kozam, 234 E. Clinton Ave., Tenafly, N.J. 07670, and Pat Romanelli, 224 Brook St., Harrington Park, N.J. 07640**

**Filed May 27, 1981, Ser. No. 267,679**
**Int. Cl.³ A61M 5/00**
**U.S. Cl. 604—191** **10 Claims**

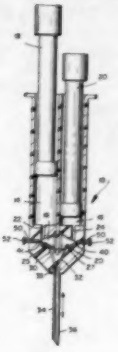
1. A multiple barrel syringe for the selective dispensing of fluids, comprising:

a body portion having a plurality of fluid-retaining bores, a plurality of individually-depressible plungers extending respectively into said bores, a single hollow needle mounted on said body portion, and fluid conduit means connecting each of said bores with the interior of said hollow needle,

said fluid conduit means comprising a first fluid conduit communicating with each of said bores, a valve recess communicating with each first fluid conduit, and a second fluid conduit communicating at one end with said valve recess and at the other end with the interior of said hollow needle,

a flexible valve member housed in each of said valve recesses and normally filling the interior thereof with the body of the valve member covering and sealing off the communicating ends of said first and second fluid conduits against passage of fluid upwardly through said conduits,

and a movable seal-release member movably mounted adjacent each respective valve recess, each seal-release member having a portion projecting outwardly from the exterior of said syringe body portion and positioned to be selectively and manually actuated to move said seal release member into engagement with the valve member in said recess in a direction to engage and deform said valve member sufficiently to unseal the communicating ends of said first and second fluid conduits, whereby to permit fluid to be drawn upwardly through said needle to the bore communicating with the valve recess containing said deformed valve member, in response to withdrawal of the plunger in said bore, whereby each of said bores may be filled independently with a different fluid through the single needle.



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**4,381,779**

**DEFORMABLE SLIDABLE PISTON TO PROVIDE SELF-ASPIRATION IN HYPODERMIC CARTRIDGE AMPOULES**

**Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.**

**Filed Jul. 16, 1981, Ser. No. 284,055**
**Int. Cl.³ A61M 5/00**
**U.S. Cl. 604—202** **14 Claims**

1. In a slidable piston for use in closing the upper end of a hypodermic syringe cartridge ampoule containing an injecta-

ble fluid therein and which is closed at its lower end by a pierceable diaphragm and at its upper end by a slidable piston, said piston being provided with a deformable section at the lower end thereof for generation of self-aspiration by deformation of said deformable section, the improvement which comprises:

a slidable piston having a rear body section connected to a deformable, generally dome shaped section by a neck portion, said deformable section being contiguous with an exterior surface of said piston, thereby obviating an interior cavity in said piston, said rear body section being of slightly lesser diameter than said deformable section and said rear body and deformable sections each being adapted for slidable frictional engagement with the bore of said cartridge ampoule whereby an aspirating condition is generated within said ampoule by the partial downward collapse of said dome and return thereof to its original shape upon alternate exertion of downward pressure on said piston and release thereof.

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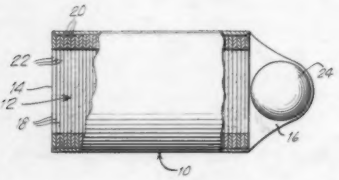
**4,381,780**

## SUSTAINED RELEASE DELIVERY SYSTEM

**Joseph W. Holloway, Maryville, Tenn., assignor to Research Corporation, New York, N.Y.**

**Filed Jan. 19, 1981, Ser. No. 226,391**
**Int. Cl.³ A61M 7/00; A61D 7/00**
**U.S. Cl. 604—892** **39 Claims**




1. A device for the prolonged administration of a substance into a fluid environment, comprising:

a hollow body member having an interior chamber, and provided with an opening in fluid communication with the exterior of said body,

said body made from a material which maintains its integrity during the administering period; and

a plurality of serially arranged partitions positioned within said interior chamber

said partitions made from a material which is degraded during the administering period upon exposure to the fluid environment exterior to said body,

said partitions each releasing a dosage of the substance to be administered upon degradation of the partition,

and arranged in an order to be contacted and degraded sequentially by fluid entering said opening thereby releasing sequentially the dosages of the substance into the first environment.

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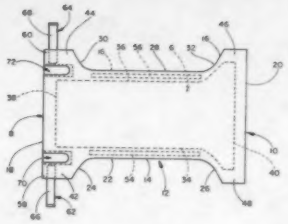
**4,381,781**

## FLEXIBLE WAIST DIAPER

**Michael A. Sciaraffa, Outagamie County, and Leona G. Boland, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Jan. 5, 1981, Ser. No. 222,359**
**Int. Cl.³ A41B 13/02**
**U.S. Cl. 604—372** **20 Claims**

1. In a disposable diaper having a liquid permeable top sheet for placement adjacent a body, a liquid impermeable backsheet joined to said topsheet, an absorbent pad disposed between said sheets, front and rear waist area at opposite ends of the diaper, a pair of side edges extending the length of the diaper, front and rear waist edges formed by the joined sheets and extending the width of the diaper, and fastening means secured to one of said waist areas for connecting the front and rear waist areas together, the improvement wherein a waist area includes an opening in both of the joined sheets, said opening intersecting a waist edge, and an elastic layer disposed in said opening and



forming a part of said waist edge, said elastic layer being joined to at least one of said sheets whereby the waist area may be effectively stretched and tightened when tension is applied to the waist area by the fastening means during connection of the front and rear waist areas.

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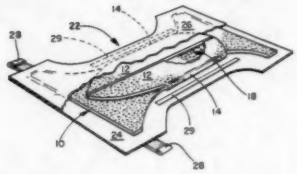
**4,381,782**

## HIGHLY ABSORBENT MATERIALS HAVING GOOD WICKING CHARACTERISTICS WHICH COMPRISE HYDROGEL PARTICLES AND SURFACTANT TREATED FILLER

**Peter A. Mazurak, and Donald M. Fries, both of Outagamie, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Apr. 21, 1981, Ser. No. 256,067**
**Int. Cl.³ A41B 13/02; B32B 5/24, 5/26, 5/30**
**U.S. Cl. 604—368** **13 Claims**



1. A low density highly absorbent material having improved wicking characteristics comprising an intimate mixture of particulate hydrogel material with 5 to 95 percent by weight of a filler material, said filler material having an average particle diameter 1 to 10,000 times the average hydrogel particle diameter and having been treated with a surfactant.

8. The material of claim 1 wherein the surfactant is added at a level of up to about 1.0 percent by weight remaining on the material after drying.

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**4,381,783**

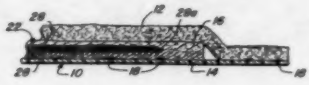
## ABSORBENT ARTICLE

**Robert T. Elias, Downers Grove, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.**

**Continuation of Ser. No. 954,152, Oct. 24, 1978, abandoned. This application Jun. 18, 1981, Ser. No. 274,931**
**Int. Cl.³ A41B 13/02**
**U.S. Cl. 604—368** **22 Claims**

1. An absorbent article comprising a moisture-permeable first outer layer, an absorbent layer adjacent said outer layer, said absorbent layer including at least one discrete pocket therein, at least a portion of said pocket being moisture permeable, said pocket containing therewithin a substantially dry uniform admixture of discrete particulate water-insoluble hy-

drocolloid material and discrete water-insoluble introfying paticles, each of said introfying particles being physically separate from and not chemically or otherwise bound or joined to any of the hydrocolloid particles and which introfying particles maintain the particles of hydrocolloid material in



spaced relationship relative to one another, and introfying particles having sufficient structural integrity to substantially retain their size and shape when subjected to compressive forces exerted by said hydrocolloid particles as they swell and expand when wetted and a second outer layer at the side of said absorbent layer opposite from said first outer layer.

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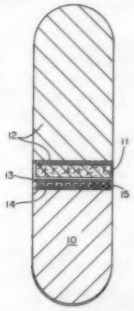
**4,381,784**

## SANITARY APPLIANCE CONTAINING BLOOD GELLING AGENT

**Gerard M. Aberson, Appleton, Wis., and Robin Powell-Toothman, Vancouver, Wash., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Feb. 17, 1981, Ser. No. 234,673**
**Int. Cl.³ A61F *13/16***
**U.S. Cl. 605—368** **9 Claims**



1. An absorbent article used for absorbing body fluids containing blood including a fluid impervious baffle, an absorbent component and a blood gelling agent which is essentially non-cross-linked and water soluble and which forms particulate disordered structures with blood protein but not with water.

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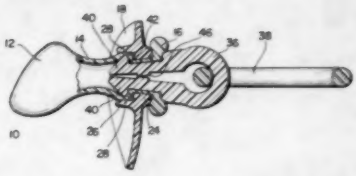
**4,381,785**

## BABY PACIFIER

**Louis Robbins, Lincoln, R.I., assignor to Reliance Products Corporation, Woonsocket, R.I.**

**Filed Dec. 15, 1978, Ser. No. 969,740**
**The portion of the term of this patent subsequent to May 3, 1997, has been disclaimed.**
**Int. Cl.³ A61J *17/00***
**U.S. Cl. 128—359** **5 Claims**

1. A baby pacifier comprising:
- a shield having a baglet side, a handle side, and a centrally disposed rectangular hole surrounded on the baglet side by a set-back and a first shoulder, and surrounded on the handle side by a second shoulder;
- an elastic baglet having a tubular shack disposed through said hole, said shank terminating in a circumferential bead;
- a plug clamp having a semicircular loop ending in a pair of third shoulders which extend into a pair of parallel spaced leaves, said leaves terminating in transverse wedges which together form an acute angle opposite said loop, each wedge having a perpendicular fourth shoulder facing said loop, the mutually facing insides of said leaves each having a fulcrum parallel to said wedge approximately midway between said wedge and said loop;



whereby as said clamp is forced into said hole and elastic baglet shank, each of the leaves pivots around its respective fulcrum until the wedges meet in a point and squeeze through the shank, whereupon, through said baglet, said second and third shoulders abut and said wedges pivot apart as said fourth shoulder latches across said set-back to the first shoulder.

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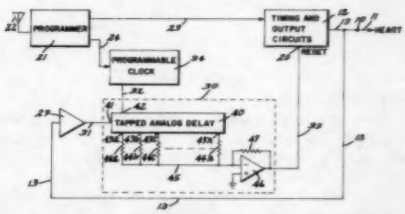
**4,381,786**

## TUNABLE ECG SENSING FILTER FOR PACEMAKER

**Stephen R. Duggan, Rosemount, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Mar. 2, 1981, Ser. No. 239,669**
**Int. Cl.³ A61N *1/36***
**U.S. Cl. 128—419 PG** **5 Claims**

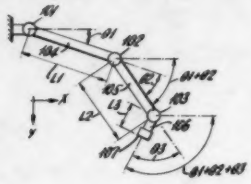



1. A tunable electrocardiogram sensing filter for a heart pacemaker, comprising:
- a transversal bandpass filter having a signal input, a clock input, and a signal output;
- means for applying signals representing the patient's electrocardiogram to the input of the transversal filter;
- a variable frequency clock connected for applying clock pulses to the clock input of the transversal filter; and
- means for adjusting the frequency of the variable frequency clock to adjust the band pass frequencies of the transversal filter, thereby to permit tuning of the filter to match the frequency characteristics of the patient's electrocardiogram.

## 4,381,787
## ULTRASOUND IMAGING SYSTEM COMBINING STATIC B-SCAN AND REAL-TIME SECTOR SCANNING CAPABILITY

Charles F. Hottinger, Englewood, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Aug. 15, 1980, Ser. No. 178,487
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 12 Claims



1. An ultrasound imaging system comprising:
(a) an articulated scan arm having an outermost terminus adapted to carry a transducer means, said scan arm including means for generating positional information concerning said outermost terminus based on the relative positions of segments of said scan arm;
(b) transducer means, removably attached to said outermost terminus of said scan arm; and
(c) means for selectively operating said transducer means to produce a sector of beams or to generate sonic beams only along a given axis.

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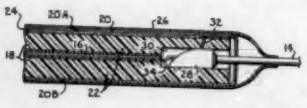
## 4,381,788
## METHOD AND APPARATUS FOR DETECTING APNEA

David W. Douglas, 9323 Alden, Lenexa, Kans. 66215

Filed Feb. 27, 1981, Ser. No. 238,813
Int. Cl.³ A61B 5/08
U.S. Cl. 128—722 1 Claim

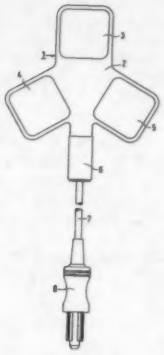


1. A method of monitoring a patient for apnea, said method comprising the steps of:
placing the patient on a transducer pad which functions as a capacitor having a pair of spaced apart capacitor plates;
effecting a small degree of relative movement of the capacitor plates when motion of the body occurs in the area near the center of the body of the patient, thereby providing a small change in the capacitance of the pad in response to body movement corresponding to cardiovascular motion which is concentrated near the center of the body;
effecting a larger degree of relative movement of the capacitor plates when motion of the body occurs in the peripheral area of the body of the patient, thereby providing a larger change in the capacitance of the pad in response to body movement corresponding to respiratory motion which is concentrated near the peripheral area of the body; and
sensing the larger change in the capacitance of the pad while rejecting the small change in the capacitance, whereby body motion corresponding to respiratory motion is sensed and body motion corresponding to cardiovascular motion is rejected.

## 4,381,789
## ELECTRODE SYSTEM

Georg Naser, Zirndorf; Franz Strahwald, Ebermannstadt, and Erich Szebi, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,431
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 7932779[U]
Int. Cl.³ A61N 1/04
U.S. Cl. 128—798 15 Claims

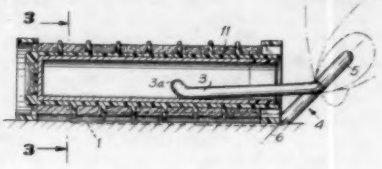


1. An electrode system for supplying electric signals to a body surface of a patient, said system comprising an electrode arrangement including a housing, electrode contact means supported by said housing for emplacement in conforming relation to the body surface of the patient for supplying electrical signals to the patient, and electrical line means electrically connected to the electrode contact means and leading from the housing for electrical connection with an interference current apparatus, or the like, said electrode arrangement having an extended area frontal face for disposition in confronting conforming relation to the body surface of the patient, the housing being an extended area flexible generally flat formed layer of electrically insulating plastic; said electrode contact means comprising flexible electrically conductive layers of extended area generally flat configuration having extended area interior surfaces within the housing and extended area exterior surfaces disposed exterior to the housing and separated by a thickness dimension from the extended area interior surfaces; flexible wire webs of electrically conductive material and of generally flat extended area configuration and of area substantially corresponding to the area of the interior and exterior surfaces and being embedded at the interior surfaces so as to be separated from said exterior surfaces of said flexible electrically conductive layers, said flexible wire webs being connected with said electrical line means such that electric signals are supplied from the electrical line means to the wire webs and from the wire webs through the thickness dimension of the flexible electrically conductive layers to substantially the entire area of the exterior surfaces of said flexible electrically conductive layers; said flexible electrically conductive layers (3–5, 11–13) being of material sealable with said electrically insulating plastic and being embedded flatwise in said generally flat formed layer (2, 10) of said electrically insulating plastic in such a fashion that the exterior surfaces of the flexible electrically conductive layers and adjacent surfaces of the generally flat formed layer of said electrically insulating plastic are continuously sealed to each other at their boundaries and such that said electrode arrangement as a whole has a substantially constant flexibility over the entire extent thereof which is to be conformed to the body surface.

## 4,381,790
## ROLLER CLIP

William E. Springer, Bridgeport, Conn., and Stewart E. Kurtz, Mount Kisco, N.Y., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 115,653, Jan. 28, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,694
Int. Cl.³ A45D 2/24
U.S. Cl. 132—37 R 10 Claims




1. A roller clip comprising:

a. A U-shaped member having a first leg terminating in a first longitudinal member, a second leg terminating in a second longitudinal member, wherein said first and second legs and said longitudinal members form a first obtuse angle therebetween from a side point of view, and an interconnecting portion interconnecting the first leg and the second leg and wherein said first longitudinal member and said second longitudinal member, from a side point of view, are in the same plane;

b. A third longitudinal member projecting from said interconnecting portion and wherein said third longitudinal member, from a side point of view, is in a plane above the first and second longitudinal members along its entire length;

c. A handle projecting from said interconnecting portion whereby a curler may be engaged between the first longitudinal member and the third longitudinal member, and between the second longitudinal member and the third longitudinal member so that the first and second longitudinal members rest on the scalp; and wherein notches are provided between the first leg and the first longitudinal member and between the second leg and the second longitudinal member.

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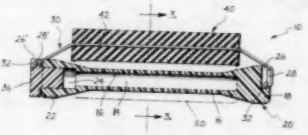
## 4,381,791
## PERMANENT WAVE MANDREL DEVICE FOR HAIR

Jean Van Sickle, 802 23rd St., Vienna, W. Va. 26105

Filed Sep. 26, 1980, Ser. No. 191,823
Int. Cl.³ A45D 2/00
U.S. Cl. 132—40 10 Claims




1. A permanent wave, mandrel device for hair, comprising a rod having an outside surface on which hair is to be rolled to form a curl, an elongated pressure element extending along said rod and adapted to press the hair curl tightly against the outside surface of the rod to thereby maintain said hair in a curl about said rod, and a pad adapted to be positioned between the pressure element and the outside surface of the curl and extending substantially along the length of said rod to cushion the pressure applied to the outside surface of the curl by the pressure element so as to prevent damage to hair strands.

## 4,381,792
## COMPOSITIONS, ARTICLES AND METHODS FOR POLISHING SURFACES

Francis W. Busch, Jr., Southbury; Thomas J. Pallone, Monroe; Gene R. Berube, Cheshire, all of Conn.; Ambrish H. Vyas, Greenville, N.C.; Joseph R. Faryniarz, Ansonia, Conn., and John A. Russo, Westport, Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Division of Ser. No. 142,831, Apr. 22, 1980, Pat. No. 4,343,910. This application May 14, 1982, Ser. No. 378,206
Int. Cl.³ A45D 29/04
U.S. Cl. 132—75.6 18 Claims

1. A polishing article, which comprises a holding implement and a polishing composition comprising a foamed polymer, and having distributed throughout a particulate abrasive compound, said compound having a particle size and a valley abrasion number the product of which yields a number which falls in the range between 300 and 1650.

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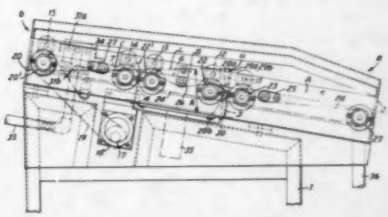
## 4,381,793
## PRINTED CIRCUIT PLATE WASHING APPARATUS

Mineo Ishii, Fukuyama, and Kosei Arimoto, Kasaoka, both of Japan, assignors to Ishii Hyoki Co., Ltd., Japan

Filed Mar. 27, 1981, Ser. No. 248,119
Claims priority, application Japan, Mar. 28, 1980, 55-41107
Int. Cl.³ B08B 3/02
U.S. Cl. 134—60 3 Claims

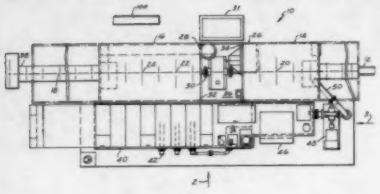


1. An ultrasonic waves washing apparatus comprising a washing/treatment tank divided into three sections such as a bring-in chamber, a washing chamber, and a wash-out/finishing chamber, said washing-out/finishing chamber being elevated in smooth slope with a certain fixed angle from said bring-in chamber to effect smooth washing treatment, thereby causing washing water contained in said wash-out/finishing chamber to be overflown into said washing chamber and said bring-in chamber in this order through partition walls, carry means such as belts, chains or wire nets mounted in each of said three chambers, an insertion port sealed by rubber-oriented elastic means, composed at a partition wall between said bring-in chamber and said washing chamber, said articles to be washed being directly inserted into a washing water contained in said washing chamber from said bring-in chamber through said insertion port, and an ultrasonic wave transmitter means mounted in said washing chamber.

## 4,381,794
## INDUSTRIAL WASHER STRUCTURE

John F. Stimac, Milford, and Paul E. Goulet, Mason, both of Mich., assignors to Industrial Metal Fabricators Co., Detroit, Mich.

Filed Oct. 23, 1980, Ser. No. 199,741
Int. Cl.³ B08B 13/00
U.S. Cl. 134—67 11 Claims



9. In an industrial washer including a conveyor for receiving parts to be washed and indexing them longitudinally through the industrial washer structure between a plurality of aligned stations, and further including covers provided over both ends of the conveyor and over the stations associated therewith, each of said covers having a top wall, spaced side walls and an end wall to substantially completely enclose the part of said conveyor and said stations associated therewith, bulkhead means extending transversely across said conveyor between two of said stations, said top and side walls of said covers engaging said bulkhead means in their closed positions and means for selectively independently moving the covers at both ends of the conveyor parallel to the conveyor for exposing different significant portions of the conveyor.

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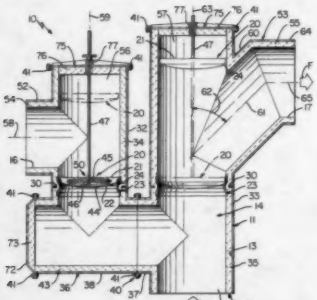
## 4,381,795
## DIVERTER VALVE CONSTRUCTION AND METHOD OF MAKING SAME

John B. Power; Thomas M. Casale, both of Arlington Heights, and Victor Pauperas, Oak Lawn, all of Ill., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 2, 1981, Ser. No. 239,234
Int. Cl.³ F16K 49/00
U.S. Cl. 137—240 3 Claims



1. In a diverter valve construction for controlling flow therethrough of a high temperature fluid, said valve construction comprising

a metal housing, a refractory lining carried by said housing and lining substantially the entire inside surface of said housing, passage means in said valve construction including an inlet passage and a pair of outlet passages, and flow control means for controlling flow of said fluid between said inlet and outlet passages, said flow control means comprising a pair of poppet valves, each of said poppet valves being supported within said housing and being adapted to be operated independently of the other poppet valve, each of said poppet valves having a closure assembly with a silicon carbide ceramic protective member fixed thereto, and a pair of silicon carbide ceramic tubular valve seat members fixed against said refractory lining with each seat member being adapted to receive a protective member of an associated closure assembly thereagainst, each of said closure assemblies cooperating with an associated seat member to control flow therethrough to an associated outlet passage, each of said seat members enabling repeated cycling of an associated protective member thereagainst with minimum wear,

said valve housing comprising a pair of parallel tubular portions each having a corresponding tubular portion of said refractory lining and a transverse tubular portion interconnecting said parallel portions adjacent one end portion thereof and placing same in flow communication and also having a corresponding portion of said refractory lining comprising same, said inlet passage being provided in one of said parallel portions, one of said outlet passages being associated with said one parallel portion and the other of said outlet passages being associated with the other of said parallel portions, each of said poppet valves being adapted to be operated in an associated one of said parallel portions to control flow therethrough to an associated outlet passage, each of said ceramic tubular valve seat members being fixed against an associated tubular portion of refractory lining, said ceramic tubular seat members being disposed adjacent said inlet passage and said transverse tubular portion being disposed upstream of said tubular seat members,

each of said closure assemblies having a refractory material defining the main body thereof, each main body having an associated protective member comprising same, a structural disc embedded substantially centrally within said body, a poppet valve actuating stem operatively associated with said disc and extending through a portion of the refractory material defining said main body of an associated assembly, and actuating means operatively connected to said stem for actuating the associated stem and assembly, and

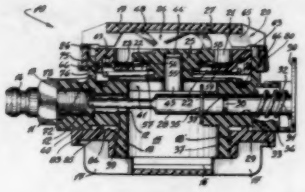
each of said closure assemblies having a disc-enclosing wall embedded in its refractory material; said enclosing wall having a side wall portion adjoined at its opposite ends by a top wall and a bottom wall; said disc being disposed within said side wall and having its peripheral edge fixed to said side wall so that said disc is disposed roughly centrally within said enclosing wall and defines an upper chamber and a lower chamber in the assembly on opposite sides of said disc; a plurality of openings in said disc interconnecting said chambers; a main structural tube defining said valve actuating stem; a flow tube disposed concentrically within said structural tube and defining a cylindrical volume between said flow tube and said structural tube; a plurality of orifices in said structural tube adjacent a top surface portion of its structural assembly providing flow passages out of said cylindrical volume; said flow tube extending through said upper chamber, through said disc in sealed relation, and exiting into said lower chamber; and means for flowing a cooling fluid through said flow tube causing said cooling fluid to flow into said bottom chamber, upwardly through said openings into said top chamber, into said cylindrical volume, and exit said orifices to cool its stem and assembly; said cooling fluid upon exiting said orifices also serving to bathe the area of contact between its closure assembly and seat member with its closure assembly against its seat member to provide a cleaning action.

**4,381,796**

## AUTOMATIC PRESSURE VALVE

**Andre Stockli, 2086 Prieur, Montreal, (Quebec), and Gilles Desmarais, St-Foy, both of Canada, assignors to Andre Stockli, Montréal, Canada**

**Filed Apr. 29, 1980, Ser. No. 144,882**
**Int. Cl.³ F16K *11/20***
**U.S. Cl. 137—596.2** **17 Claims**



1. An automatic valve for a pressure enclosure submersible in a liquid medium, said valve comprising a valve body, an inlet port in said body having an actuable valve member to admit pressurized gas in a valve chamber in communication with an enclosure to which said valve is secured, an adjustable cover member displaceably secured to said body and having at least one exhaust orifice, an outlet port in said body communicating with said valve chamber and having an automatic pressure regulating valve mechanism therein preventing liquid ingress to said chamber, said valve mechanism being adjustable by a pressure biasing member controlled by a first displacement of said adjustable cover member to control the pressure of said gas in said enclosure by automatically exhausting some of said gas through said outlet port when said pressure exceeds a preset pressure of said mechanism, a displaceable valve member associated with said valve mechanism and displaceable by a second displacement of said cover member to exhaust gas from said enclosure through said outlet port while preventing ingress of liquid to said chamber.

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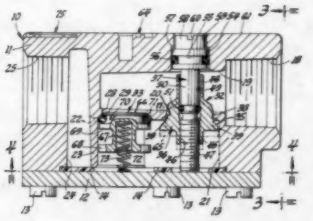
**4,381,797**

## FLOW CONTROL VALVE WITH A NON-RISING STEM

**James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.**

**Filed Feb. 9, 1981, Ser. No. 232,834**
**Int. Cl.³ F16K *15/02***
**U.S. Cl. 137—599** **6 Claims**



1. A fluid flow control valve for controlling the flow of pressurized fluid in a flow circuit that includes a fluid controlled apparatus, characterized in that the valve includes:

(a) a valve body having a first fluid port and a second fluid port, and an upper passageway formed in said valve body and extended inwardly from said first fluid port, and a lower passageway formed in said valve body and extended inwardly from said second fluid port and under said upper passageway, and a dividing wall having a first opening and a second parallel opening between said upper and lower passageways, and a first and second circular valve seat formed on the lower end of said first and second openings, respectively, and said lower passageway having an opening to the exterior of the valve body which is enclosed by a releasably mounted bottom cover plate:

(b) a flow control valve means operatively mounted in said first dividing wall opening and having a valve element adjustably movable between open and closed positions relative to said first valve seat to provide a controlled flow of fluid under pressure when pressurized fluid is flowing through said passageways in one direction from said first fluid port to said second fluid port;

(c) a check valve means operatively mounted in said second dividing wall opening in parallel with said flow control valve means, and disposed in a closed position on said second valve seat when pressurized fluid is flowing through said passageways in said one direction and movable to an open position to provide a free flow of fluid through said passageways in the other direction from said second fluid port to said first fluid port;

(d) said flow control valve means including the flow control valve element in the lower passageway adjustable toward and away from said first valve seat and a non-rising valve stem operatively connected to said flow control valve element for adjustment exterior of the valve body for adjusting the valve element relative to said first valve seat without axial movement of the valve stem, to close and open the flow control valve means;

(e) said non-rising valve stem has an integral cylindrical head on the upper end thereof which is rotatably mounted in a bore formed through the upper end of the valve body and extending from the top end surface thereof into communication with the upper passageway, and said valve stem head includes an annular flange;

(f) said valve element has an axial bore therethrough which is partially threaded, and said valve stem having a lower, integral threaded end that extends through the axial bore in said valve element and threadably engages the valve element and has its outer end in abutting engagement with the valve body bottom cover plate; and,

(g) said valve body includes means for restraining axial movement of the valve stem when it is rotated, including a shoulder in the bore in the upper end of the valve body which engages the annular flange on the valve stem to restrain said axial movement in an upward direction, the said axial movement is restrained in the downward direction by the valve body bottom cover plate, whereby when the valve stem is rotated the flow control valve element is adjusted relative to said first valve seat without axial movement of the valve stem.

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**4,381,798**

## COMBINATION REVERSING VALVE AND EXPANSION DEVICE FOR A REVERSIBLE REFRIGERATION CIRCUIT

**Curtis L. Tobin, Chittenango, and Joseph A. Ciarlei, Brewerton, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

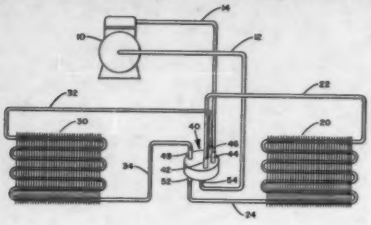
**Division of Ser. No. 126,057, Feb. 29, 1980, Pat. No. 4,311,020.**
**This application Aug. 21, 1981, Ser. No. 294,963**
**Int. Cl.³ F16K *11/07***
**U.S. Cl. 137—625.43** **12 Claims**

1. A reversing valve for use in a refrigeration circuit for altering the flow path of refrigerant therethrough which comprises:

a valve housing having at least four ports, a first port adapted to be connected to receive refrigerant from a compressor, a second port adapted to be connected to a first heat exchanger, a third port adapted to be connected to a second heat exchanger and a fourth port adapted to be connected to pass refrigerant to the compressor;

a cylindrical valve gate mounted within the housing, said valve gate having a first U-shaped passageway located within a top portion of the valve gate for directing fluid flow from the first port to the second port when the valve

is in a first position and to the third port when the valve is in a second position and a second passageway extending across the bottom of the valve gate in communication with the fourth port and having end portions for connecting either to the second port or the third port, said second



passageway passing fluid flow from the third port to the fourth port when the valve is in the first position and from the second port to the fourth port when the valve is in the second position; and

means for placing the valve in the first and second positions.

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**4,381,799**

## CHANGEOVER VALVE UNIT FOR POWER-ASSISTED STEERING SYSTEMS

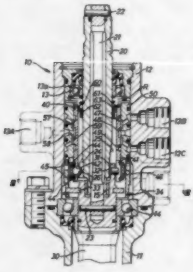
**Yoshimi Sato, Susono; Nobuo Hiraiwa, Toyota, and Akira Hasegawa, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jan. 12, 1981, Ser. No. 224,015**

**Claims priority, application Japan, Jul. 8, 1980, 55-93630**

**Int. Cl.³ F15B 9/10**

**U.S. Cl. 137—625.68** **6 Claims**



1. In a changeover valve unit for a power-assisted steering system comprising:

a housing provided with a fluid inlet and a fluid outlet;

input and output shafts arranged for relative rotation on aligned axes within said housing;

a reaction member interconnecting said input and output shafts to permit relative rotation of said shafts;

a spool valve element in surrounding relationship with said input shaft and arranged to be displaced in response to relative rotation of said shafts in an axial direction for controlling the flow of fluid between said fluid inlet and said fluid outlet;

resilient means for biasing said spool valve element in the axial direction; and

means for causing axial displacement of said spool valve element in response to relative rotation of said shafts;

the improvement wherein an annular member is engaged at an outer periphery thereof with one end of said spool valve element and positioned in place under the biasing force of said resilient means to form an oil chamber subdivided from the interior of said spool valve element; and orifice means is formed between the inner periphery of said annular member and the outer periphery of said input shaft for throttling the flow of fluid between said oil chamber and the interior of said spool valve element.

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**4,381,800**

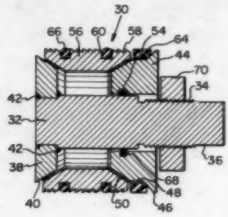
## PIPE TESTER PLUG

**Bruce E. Leslie, Baden, Pa., assignor to Thaxton Inc., Gibsonia, Pa.**

**Filed Aug. 31, 1981, Ser. No. 297,578**

**Int. Cl.³ F16L 55/10**

**U.S. Cl. 138—90** **7 Claims**



1. A high pressure plug for insertion into a pipe having a joint to be tested comprising:

A. a stem having a threaded section and a smooth section and terminating at a first end in a fixed tapered washer;

B. a plurality of grip segments arranged in cylindrical form about the stem and having aligned tapered openings at a bottom end and a top end, said tapered bottom end adapted to cooperate with the washer;

C. an annular floating mandrel positioned about the stem and comprised of an upper retaining section, an adjacent cylindrical section, a tapered entry section adapted for cooperation with the top end of the grip segments, a central bore and an internal annular recess communicating with the central bore;

D. an O-ring positioned in the internal recess of the floating mandrel and adapted for sliding sealable engagement with the smooth section of the stem;

E. a ring-shaped seal rectangular in cross section positioned about the cylindrical section of the floating mandrel and retained by the upper retaining section; and

F. a nut for threadably engaging the threaded portion of the stem and engageably forcing the floating mandrel into the top end of said grip segments,

whereby said O-ring sealably engages said stem and said seal engages the pipe interior to isolate the joint and define a small volume for testing.

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**4,381,801**

## THERMAL INSULATION FOR PIPES AND METHOD FOR FABRICATING THE SAME

**Alfred Brunner, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Aug. 17, 1979, Ser. No. 67,704**

**Claims priority, application Switzerland, Aug. 31, 1978, 9191/78**

**Int. Cl.³ F16L 9/14**

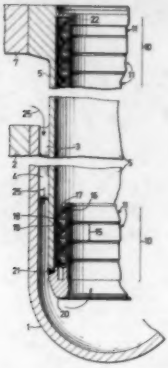
**U.S. Cl. 138—148** **12 Claims**

1. In combination,

a pipe having a peripheral wall defining a flow path for a flowable medium, and

thermal insulation slidably mounted on at least one side of said wall, said insulation including a plurality of spatially deformed sheet metal annular elements resting resiliently

against said wall and aligned coaxially longitudinally of said pipe, said elements defining a plurality of annular cells



therebetween for retarding heat transfer to and from said pipe wall.

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**4,381,802**

## CLOTH TEMPLING DEVICE FOR LOOMS

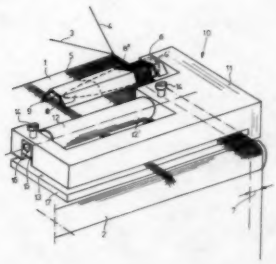
**Rudolf Zwiener; Werner Beer, both of Arbon, and Giuseppe D. Santo, Gallen, all of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland**

**Filed May 11, 1981, Ser. No. 262,681**

**Claims priority, application Switzerland, May 23, 1980, 4049/80**

**Int. Cl.³ D03J *1/22***

**U.S. Cl. 139—294** **13 Claims**



1. In a fabric templing device for looms which contains a respective temple containing a porcupine roller for each fabric selvedge, with a domed cover member extending over each temple in order to place the marginal region of a woven fabric web against an outer surface of the related porcupine roller, the improvement which comprises:

a contact roll operatively associated with a related one of the porcupine rollers;

said contact roll being arranged after the related porcupine roller; and

means defining a countersurface with which coacts said contact roll, in order to subsequently fixedly retain the woven fabric which has been spread apart by the porcupine rollers.

**4,381,803**

## ELECTRONIC WEFT THREAD MONITOR

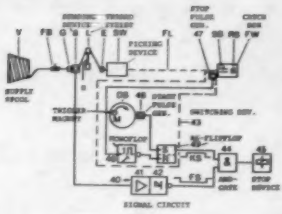
**Erich Weidmann, Wetzikon, and Alfred Rüegg, Bauma, both of Switzerland, assignors to Gebrüder Loepfe AG, Wetzikon, Switzerland**

**Filed Mar. 16, 1981, Ser. No. 244,206**

**Claims priority, application Switzerland, Apr. 1, 1980, 2556/80**

**Int. Cl.³ D03D *51/34***

**U.S. Cl. 139—370.2** **4 Claims**



1. In an electronic weft thread monitor on a gripper shuttle weaving machine provided with a picking device, a catch box with means for braking and returning, after weft thread insertion, the gripper shuttle to a defined thread releasing position, and a thread tensioner arranged between a fixed thread guide eye and the picking device and serving for deviating and tensioning the weft thread during the push back motion of the gripper shuttle, the weft thread monitor comprising a sensing device located in the region between the thread guide eye and the thread tensioner and containing means responsive to weft thread motion relative thereto during the insertion and deviation intervals, and further comprising a switching device for producing a control signal defining the time interval in which the weft thread is monitored, the improvement that the weft thread motion responsive means of said sensing device having a first range of high response sensitivity and a second range of low or no response sensitivity, and a guide member for guiding the weft thread through the said first and second ranges of the weft thread motion responsive means, in a direction transverse to the longitudinal dimension of the weft thread when deviated and tensioned by the thread tensioner.

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**4,381,804**

## WOVEN SLIDE-FASTENER STRINGER

**Karl Griessbaum, Essen, Fed. Rep. of Germany, assignor to Opti Patent-, Forschungs- und Fabrikations-AG, Riedern-Allmeind, Switzerland**

**Filed Feb. 24, 1981, Ser. No. 237,672**

**Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007276**

**Int. Cl.³ D03D *1/00*; A44B *19/34***

**U.S. Cl. 139—384 B** **8 Claims**

1. In a slide fastener having a stringer half formed with a woven ground-weave tape and a continuous monofilament coupling element woven into said tape during the weaving thereof and wherein said tape has a ground weave comprising ground warp yarns forming warp pockets receiving ground double wefts reaching to a longitudinal edge of the tape and formed by a continuous ground weft yarn, said coupling element comprising a multiplicity of coupling members spaced along apart along said edge with each coupling member having a coupling head projecting beyond said edge and a pair of shanks having superposed projections in a slide fastener plane overlying a portion of said tape adjacent said edge with connecting parts bridging the shanks of successive coupling members, the improvement wherein in combination:

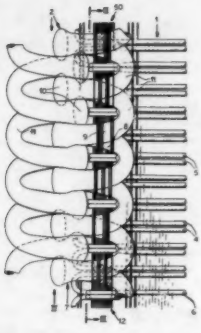
said coupling element is secured to said tape on said portion by a plurality of connecting warp yarns;

the shanks of each coupling member form a double weft inner woven with said connecting warp yarns;

respective double wefts underlie each coupling member while interstitial ground double wefts lie between the coupling members;

said connecting warp yarns are offset longitudinally from one another with a stagger of at least one pick;

each of said connecting warp yarns overshoots two successive coupling members and passes below the interstitial double weft therebetween, and then engages below the next coupling member between the bottom shank thereof



and the double wefts therebelow, and is then secured in the tape portion below the coupling element in a repeating pattern; and

the interstitial double wefts disposed between successive coupling members are drawn by at least one of the connecting warp yarns as a ground weft padding loop away from the ground weave at least past the median plane of the coupling to the upper level of such members so that each padding loop substantially fills the space between the pair of respective coupling members and from the connecting parts thereof to a head of another coupling member receivable between the coupling members of said pair.

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**4,381,805**

## SIMULATED GRASS PILE FABRIC

**James E. Troy, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.**

**Filed Feb. 9, 1981, Ser. No. 232,895**
**Int. Cl.³ D03D *27/00, 27/06;* D04B *21/02***
**U.S. Cl. 139—391** **10 Claims**

1. A simulated grass pile fabric of the woven or warp knit type for playing a variety of ball games and other sports thereon and characterized in that the surface of the pile fabric defines a playing surface on which the playing ball rolls substantially equally free in all directions and bounces substantially equally true in all directions to provide for the safer playing of sports thereon, said fabric comprising

a base of interlaced warp and filling yarns, and pile yarns interlaced with the base and extending upwardly therefrom and defining cut pile tufts forming a pile face on the fabric, and wherein

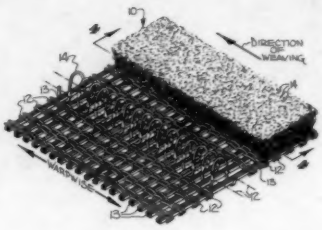
said warp yarns comprise synthetic yarns of a yarn size within the range of about 1300 to 3000 denier,

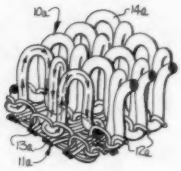
said filling yarns each comprise a fibrillated synthetic strand of a yarn size within the range of about 2200 to 4400 denier, and

said pile yarns comprise textured multifilament yarns of a yarn size greater than 4500 denier, and wherein each of the filaments thereof is ribbon-like and of about 150 to 300 denier and is crimped to impart sinuosity thereto throughout its length, with the crimped filaments being randomly oriented relative to each other to enhance the bulk of the pile yarns,

said pile yarns are arranged in warpwise and fillingwise rows of cut pile tufts, and

wherein the pile on the fabric is substantially macroscopi-





cally devoid of any grain or direction of lay of the pile tufts to thereby present a simulated grass surface for playing a variety of ball games and other sports thereon and wherein the playing ball rolls substantially equally free in all directions and bounces substantially true in all directions.

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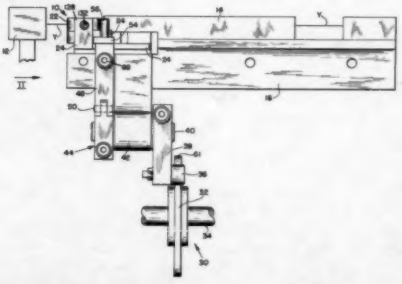
**4,381,806**

## YARN CLAMP

**Daniel P. Grigas, South Dennis, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.**

**Filed Feb. 27, 1981, Ser. No. 239,225**
**Int. Cl.³ D03D *47/34***
**U.S. Cl. 139—450** **6 Claims**



1. A yarn clamp for textile machines, comprising:

(a) a supporting frame;

(b) a first clamping roller mounted on the supporting frame for rotation about its axis;

(c) A second clamping roller mounted on the supporting frame for rotation about its axis;

(d) means for moving said first and second clamping rollers into and out of contact with each other;

(e) means for imparting at least a partial rotation to each of

said clamping rollers while they are out of contact with each other; and

(f) means for wiping the surfaces of the clamping rollers as they rotate to remove any lint that may have accumulated on their surfaces.

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**4,381,807**

**SHUTTLELESS LOOM WEFT DETAINING DEVICE**

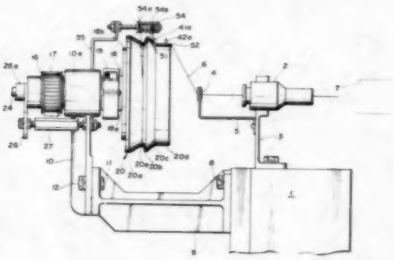
**Hidetugu Umezawa, Higashiyamato; Miyuki Gotoh, Machida; Shigenori Tanaka, Hachioji, and Masashi Nakao, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 7, 1980, Ser. No. 176,180**

**Claims priority, application Japan, Aug. 10, 1979, 54-101174**

**Int. Cl.³ D03D *47/36***

**U.S. Cl. 139—452** **19 Claims**



1. A shuttleless loom weft measuring and detaining device comprising:

a drum rotatable in synchronism with the operational cycle of the loom, on which drum a weft yarn is wound prior to introduction to a weft inserting nozzle, said drum being formed with a frustoconical section tapered toward the weft inserting nozzle, and a generally cylindrical section integral with said frustoconical section, said cylindrical section being located nearer to the weft inserting nozzle than is said frustoconical section, the weft yarn supplied from weft yarn supply means to said frustoconical section being introduced through said cylindrical section to the weft inserting nozzle;

first catching means for catching a first portion of the weft yarn to detain the weft yarn on said drum at least for a period of a weft picking of the weft yarn through the weft inserting nozzle, said first catching means including a first catching member located in the vicinity of the border between said frustoconical section and said cylindrical section to catch the weft yarn first portion; and

second catching means for catching a second portion of the weft yarn to detain the weft yarn on said drum for a period except for at least the weft picking period, said second portion being located in front of said first portion relative to the direction of weft yarn movement, said second catching means including a second catching member associated with said cylindrical section to catch the weft yarn second portion, whereby a predetermined length of the weft yarn is wound on said cylindrical section between said first and second catching members prior to the weft picking.

**4,381,808**

**FILLING ELEMENT FOR COUNTERPRESSURE FILLING MACHINES**

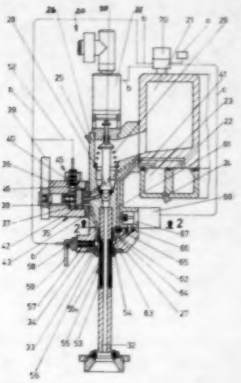
**Egon Ahlers, Neu-Bamberg, Fed. Rep. of Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany**

**Filed Apr. 9, 1981, Ser. No. 252,388**

**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015132**

**Int. Cl.³ B67C *3/06***

**U.S. Cl. 141—39** **8 Claims**



1. A filling element, for single- and multi-chamber counterpressure filling machines, for introducing liquid into a container, said filling element comprising:

a filling element body;

a filling tube having a main portion and a filling tube head, said filling element body being provided with a suitable recess for receiving said filling tube head therein from below so that said main portion of said filling tube projects downwardly from said filling element body into a pressed-on container to be filled, said filling tube head being provided with a downwardly directed shoulder, so that said filling tube head is stepped relative to said main portion of said filling tube;

a liquid flow valve arranged in said filling element body and operatively associated with said filling tube;

a switching member installed in the region of said filling tube for closing said liquid flow valve when the desired filling level of liquid in said container is obtained, said switching member being an electrical conductor which is placed on the outer side of said filling tube and is electrically insulated relative thereto; and

an electrical connection device for switching member, including an electrically insulated contact pin which is axially displaceably supported in said filling element body and is sealed off relative thereto, said contact pin having a first end and a second end, said first end of said contact pin including an end face and an adjusting peripheral surface which is perpendicular to said end face, said end face being pressable into electrical contact against said switching member, and said peripheral surface adjoining said end face being engageable under, and retractable from, the region of said shoulder of said filling tube head.

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**4,381,809**

**SPLITTING AX**

**Arthur A. Kenjorski, 18505 US 23 N., Alpena, Mich. 49707**

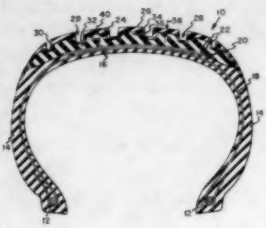
**Filed Dec. 2, 1981, Ser. No. 326,601**

**Int. Cl.³ B26B *23/00***

**U.S. Cl. 145—2 R** **6 Claims**

1. A splitting ax having a head portion consisting of a pair of oppositely disposed body members, each of which has an

upper portion and an inwardly tapered lower portion terminating in a cutting edge, said upper portions being spaced with respect to one another and terminating in upper ends on a common plane, pivot means inwardly of said upper ends join-



ing said upper portions, said lower portions defining a cavity, the opposite outer walls of which are tapered inwardly, said cavity spaced inwardly of said cutting edges, a wedge-shaped body freely positioned in said cavity, a handle and means on said head portion mounting said handle.

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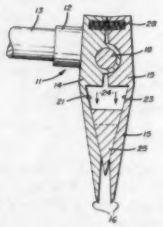
**4,381,810**

## TIRE WITH DUAL TREAD COMPOUND

**John M. Cady, Munroe Falls, and William E. Egan, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed May 22, 1981, Ser. No. 266,554**
**Int. Cl.³ B60C** *11/00, 9/00, 15/00*
**U.S. Cl. 152—209 R** **1 Claim**



1. A tire comprising a tread having a non-skid portion which includes a radially outer and a radially inner layer of elastomeric compound, said outer layer being composed of a lower rolling resistance compound than said inner layer, and said inner layer being composed of a compound which provides better traction than the compound of said outer layer, wherein

A. the compound of said outer layer has a hot rebound of at least 75 and the compound of said inner layer has a hot rebound of less than 65 according to ASTMD1054-79,

B. the kinetic coefficient of friction between the compound of said inner layer and a wet concrete surface is at least 5 percent greater than the kinetic coefficient of friction between the compound of said outer layer and the same wet concrete surface,

C. the compound of said outer layer is composed of, based upon 100 parts by weight rubber, (1) about 50 to about 90 percent butadiene/styrene rubber, about 10 to about 50 percent polybutadiene, about 60 to about 80 phr carbon black, and about 25 to about 45 phr processing oil, (2) about 40 to about 60 percent natural rubber, about 40 to about 60 percent polybutadiene, about 40 to about 60 phr carbon black, and about 10 to about 30 phr processing oil, or (3) about 80 to 100 percent natural rubber, 0 to about 20 percent butadiene/styrene rubber, about 40 to about 60 phr carbon black, and about 2 to about 5 phr processing oil, and

D. the compound of said inner layer is composed of, based upon 100 parts by weight rubber, about 60 to about 90 percent butadiene/styrene rubber, about 10 to about 40 percent polybutadiene, about 70 to about 100 phr carbon black, and about 30 to about 55 phr processing oil.

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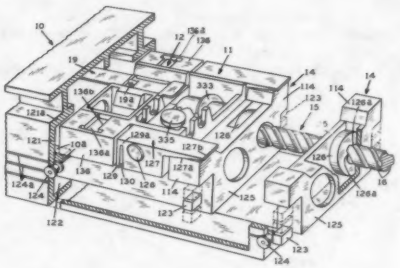
**4,381,811**

## SUPPORT CARRIER FOR THE DRIVE SHAFT OF A VERTICAL VENETIAN BLIND

**Kurt H. Frentzel, Zevenhoven, and Herman Oskam, Bergambacht, both of Netherlands, assignors to Hunter Douglas International N.V., Willemstad, Netherlands Antilles**

**Filed Apr. 3, 1980, Ser. No. 136,952**
**Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913886**
**Int. Cl.³ E06B** *9/36*
**U.S. Cl. 160—168 R** **10 Claims**



1. In a louvered venetian blind having vertical louvers, a headrail, a plurality of louver carriers mounted on said headrail for movement therealong, a drive shaft mounted in said headrail, support carriers mounted in said headrail for movement therealong and driveable by said drive shaft and said support carriers supportingly engaging said drive shaft, the improvement comprising: at least one pull carrier driveable by said drive shaft for moving said louver carriers along said headrail to open and close said blind; said pull carrier being positioned to be engaged by a support carrier upon movement of said support carrier in one direction along said headrail; and cooperating means on said pull carrier, said support carrier and said rail to brake said pull carrier against movement along said rail upon engagement of said pull carrier by said support carrier.

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**4,381,812**

## END STRUCTURE FOR A TRAVERSE ROD

**James A. Ford, and Steven R. Haarer, both of Sherman Township, St. Joseph County, Mich., assignors to Cooper Industries, Inc., Houston, Tex.**

**Filed Sep. 2, 1981, Ser. No. 298,554**
**Int. Cl.³ A47H** *5/032*
**U.S. Cl. 160—172** **13 Claims**

1. An end structure engageable with the end of a traverse rod having two side-by-side parallel channels, one thereof opening downwardly and the other opening sidewardly, and an elongated flexible element in one of said channels for effecting movement of a master carrier along said rod, comprising:

a pulley housing having guide means on one side thereof securable to said traverse rod adjacent one end thereof, said pulley housing having plural, downwardly opening compartments therein, a first said compartment also opening in an endwise direction and on the side of said pulley housing remote from said guide means;

said guide means having first and second parts, each part being axially aligned with and slidably received into a respective one of said side-by-side channels;

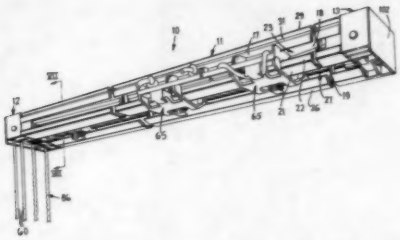
fastener means for effecting a fixed connection of said pulley housing to said traverse rod;

second and third said compartments opening in an endwise direction toward said traverse rod;

first shaft means extending at a right angle to the longitudinal axis of said traverse rod and extending through said second and third compartments;

a pair of pulleys rotatably mounted on said first shaft means and respectively within said second and third compartments, said pair of pulleys being engaged by said elongated flexible element;

second shaft means rotatably supported on said pulley housing and extending parallel to said longitudinal axis of said traverse rod;



a drive pulley fixedly secured to an end of said second shaft means and being received in said first compartment;

manually operable means drivingly engaged with said drive pulley for effecting rotation thereof;

said second shaft means being axially slidably received in aligned openings in interior walls with at least one thereof defining said first compartment, said openings being accessible through said endwise opening in said first compartment; and

said pulley housing including a fourth compartment adjacent said first compartment, said fourth compartment having a locking member mounted therein and engaging said second shaft means to prevent axial movement thereof while simultaneously permitting rotation thereof.

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**4,381,813**

## METHOD FOR MANUFACTURING FOUNDRY CORES

**Roger H. Kottke, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.**

**Filed Sep. 10, 1981, Ser. No. 300,937**
**Int. Cl.³ B28B 7/34**
**U.S. Cl. 164—527** **4 Claims**

1. A method of preparing a foundry core which comprises the steps of mixing with a neutral or acidic core sand an aromatic or aliphatic sulfonic acid and a metal compound reactable at substantially ambient temperature with said sulfonic acid to form a latent metal sulfonate catalyst for curable binders and then mixing with the treated core sand a curable binder, forming said treated core sand and binder into a desired shape and heating to cure said binder to produce said sand core.

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**4,381,814**

## CONTROL OF HEAT TRANSFER FROM HEAT EXCHANGERS IN PARALLEL

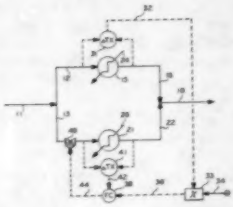
**Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 1, 1980, Ser. No. 192,791**
**Int. Cl.³ F28F 27/02**
**U.S. Cl. 165—1** **8 Claims**

5. In a parallel heat exchanger arrangement wherein first and second fluid streams are passed in heat exchange relationship in a first heat exchanger, wherein third and fourth fluid streams are passed in heat exchange relationship in a second heat exchanger, wherein said first fluid stream and said third fluid stream are combined after passing through said first heat exchanger and second heat exchanger respectively to form a combined stream, wherein the temperature of said fourth fluid stream is greater than the temperature of said third fluid stream if the temperature of said second fluid stream is greater than the temperature of said first fluid stream and wherein the temperature of said fourth fluid stream is less than the temperature of said third fluid stream if the temperature of said second fluid stream is less than the temperature of said first fluid stream, a method for substantially maximizing the efficiency of the parallel combination of said first and second heat exchangers comprising the steps of:

establishing a first signal representative of the differential temperature across said first heat exchanger;

establishing, in response to said first signal, a second signal representative of the differential temperature across said



second heat exchanger required to substantially maximize the efficiency of the parallel combination of said first and second heat exchangers;

establishing a third signal representative of the actual differential temperature across said second heat exchanger;

comparing said second signal and said third signal and establishing a fourth signal responsive to the difference between said second signal and said third signal; and

manipulating the flow of said first fluid stream to said first heat exchanger and the flow of said third fluid stream to said second heat exchanger in response to said fourth signal to thereby maintain the differential temperature across said second heat exchanger as represented by said third signal substantially equal to the required differential temperature across said second heat exchanger as represented by said second signal.

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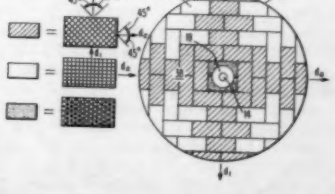
**4,381,815**

## THERMAL SHOCK RESISTANT HONEYCOMB STRUCTURES

**Rodney I. Frost, Corning; Robert D. McBrayer, Painted Post, and Vimal K. Pujari, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Nov. 10, 1980, Ser. No. 205,777**
**Int. Cl.³ F28D 19/00; B32B 3/12**
**U.S. Cl. 165—10** **17 Claims**



1. A structure subject to asymmetric thermal shock comprising:

a plurality of cellular segments joined to one another, each of said segments having a plurality of hollow, open ended cells extending therethrough, substantially all of said cells in each of said cellular segments having anisotropic Young's moduli in their cross-sectional planes, substantially all of said anisotropic cells in each of said cellular segments having an axis of minimum Young's modulus oriented in the same direction, and said direction of similarly oriented axes of minimum Young's modulus being varied from cellular segment to cellular segment in said structure so as not to be uniformly aligned in the same direction throughout said structure.

5. A heat recovery wheel having a first diameter and second diameter perpendicular thereto and formed from a plurality of joined cellular segments comprising:

a first subset of said cellular segments, each of said segments adjoining or crossed by either of said first or second diameters and having a plurality of hollow, open-ended cells with substantially square cross-sectional geometries extending therethrough, the sides forming said substantially square cross-sectional geometries being oriented at approximately 45° angles to said first and second diameters; and

a second subset of said cellular segments, each of said cellular segments having a plurality of hollow, open-ended cells with substantially square cross-sectional geometries extending therethrough, the sides forming said substantially square cross-sectional geometries being oriented at acute angles other than approximately 45° or at 90° to either said first or said second diameter.

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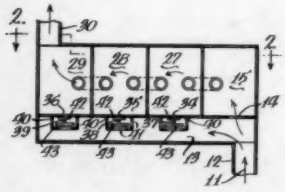
**4,381,816**

## SELF-DRAINING HEAT EXCHANGER

**Dennis C. Granetzke, and Neal A. Cook, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.**

**Filed Oct. 23, 1980, Ser. No. 200,049**
**Int. Cl.³ B60H *1/00***
**U.S. Cl. 165—40** **6 Claims**



1. A self-draining heat exchanger, comprising: liquid flow means including a plurality of tubes arranged for sequential flow of liquid through said tubes; a liquid inlet means into a first said tube in the series; an outlet liquid means communicating with a last said tube of said series; reverse flow means adjacent to said inlet means for flow of liquid from the heat exchanger into and back through said inlet means when liquid flow is interrupted; pressure operated valve means for closing said reverse flow means by pressure of liquid flowing through said tubes; means for interrupting closing pressure on said reverse flow valve means when liquid flow is interrupted, thereby permitting the pressure of liquid within said heat exchanger to open said valves for reverse flow of liquid from said heat exchanger back through said inlet means; said tubes being parallel with adjacent ends interconnected by two sets of flow chambers, a first set being adjacent to said inlet means and a second set being adjacent to said outlet means; and a flow manifold at at least said first set of flow chambers, liquid flow opening means between at least said first set of chambers and said manifold, said manifold connected to said liquid inlet, and said valve means positioned in the opening to control flow through the opening responsive to the liquid pressure in said manifold.

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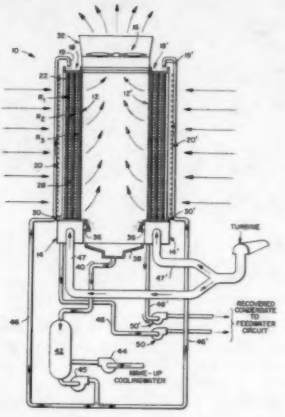
**4,381,817**

## WET/DRY STEAM CONDENSER

**Carlo J. Brigida, Convent Station, and William J. Bow, Morristown, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.**

**Filed Apr. 27, 1981, Ser. No. 258,137**
**Int. Cl.³ F28B *1/02, 1/06***
**U.S. Cl. 165—110** **8 Claims**




1. A wet/dry steam condensing apparatus comprising:

a plurality of substantially vertically aligned heat pipes, each of said heat pipes having a lower, evaporator section and an upper, condensing section and containing a selected quantity of a heat transfer fluid adapted to transfer heat energy from said evaporator section to said condensing section through a vapor/condensation cycle;

a steam receiving plenum adapted to receive steam from a steam source, at least a portion of said evaporator sections of said heat pipes passing through a surface portion of said plenum for exposure to the steam;

each of said heat pipes having a finned portion;

a flood water trough adapted to selectively receive cooling water and flow the water downwardly onto the finned surfaces of said heat pipes; and

a plurality of spray heads adapted to direct a spray of cooling water onto said heat pipes.

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**4,381,818**

## POROUS FILM HEAT TRANSFER

**Kenneth S. Sachar, Brookline, Mass., and Victor J. Silvestri, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 861,931, Dec. 19, 1977, abandoned. This application Mar. 26, 1980, Ser. No. 134,243**
**Int. Cl.³ H01L *23/42***
**U.S. Cl. 165—133** **3 Claims**

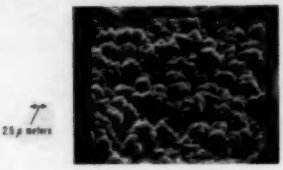
1. A substrate for carrying a thin film electrical device upon a first surface thereof, comprising

a silicon sheet with an electrical device upon said first surface,

a sputtered, highly porous, vertically extending, columnar, thin film cooling structure deposited upon the opposite surface of said sheet of from about 9 micro-meters to about 15 micro-meters,

said porous, columnar structure comprising an unoxidized, metallic, thin film, deposit with a plurality of substantially

uniformly distributed, partially enclosed, vertically extending, vapor trapping, microscopic cavities having a diameter of about one to five micro-meters with convoluted, substantially vertically extending, nonconverging walls and openings at the upper surface on the order of




one micro-meter in diameter and capillary structures with a substantial number of transverse interconnections between said cavities and adjacent ones of said cavities, and the thickness of said film being at least as great as the diameter of said cavities, thereby providing for substantial trapping of vapor in microscopic pores.

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**4,381,819**

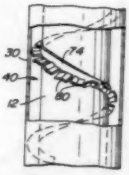
## FLUE HEAT RECLAIMER

**Ralph J. Paolino, 615 Warwick Rd, Fairless Hills, Pa. 19030**

**Continuation of Ser. No. 75,657, Sep. 14, 1979, abandoned. This application May 21, 1981, Ser. No. 265,835**

**Int. Cl.³ F24B *7/00*; F28D *7/10*; F28F *13/06***

**U.S. Cl. 165—156** **5 Claims**




1. For use with a home heater or the like having a cylindrical flue duct for the hot flue gases from the heater, a flue heat reclaimer comprising

a spiral-shaped divider adapted to fit over said flue duct with its inner edge adjacent thereto,

a cylindrical outer tube adapted to be mounted on said flue duct and having a diameter greater than the diameter of said flue duct,

said divider being adapted to fit within said outer tube with the outer edge of the divider adjacent thereto,

a first end cap enclosing one end of said outer tube,

a second end cap enclosing the other end of said outer tube,

said end caps, said outer tube, and said divider cooperating with the exterior of said flue duct to define a spiral-shaped heat exchange passage extending around the exterior of said flue duct,

means providing an inlet to one end of said heat exchange passage,

means providing an outlet from the other end of said heat exchange passage,

and fan means for causing air to flow successively from said inlet means through said heat exchange passage and said outlet means whereby the temperature of the air flowing through said heat exchange passage is raised by means of its extended heat exchange relationship with the exterior of said flue duct,

said divider being made of a strip bent longitudinally with one portion extending along the exterior of said flue duct and the other portion comprised of tabs defining the heat exchange passage.

**4,381,820**

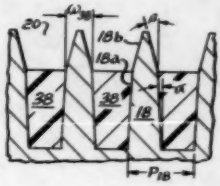
## FILAMENT REINFORCED PLASTIC SCREEN AND APPARATUS FOR MAKING SAME

**Walter R. Wagner, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Dec. 24, 1981, Ser. No. 334,105**

**Int. Cl.³ E21B *43/08***

**U.S. Cl. 166—231** **5 Claims**




1. In a well screen formed entirely of filament reinforced plastic and having an elongated helically wound slotted screen portion and integral non-slotted end portions, the improvement wherein the cross-section of the screen wires which define the slotted screen portion is of generally trapezoidal shape having its maximum dimension in a radial direction, the surface and base sides of said cross-section being generally parallel to each other and the generally radial sides being tapered in an inwardly converging direction, said last named sides being tapered at a relatively small diverging angle along the major portion of their length starting from their base side and being tapered at a relatively larger diverging angle along the remaining minor portion of their length to the surface side.

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**4,381,821**

## BLAST JOINT AND PROTECTION ELEMENT THEREFOR

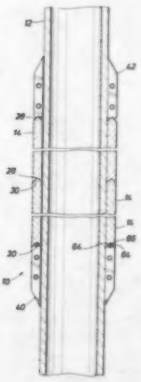
**George J. Greene, Jr., Houston, Tex., assignor to Weatherford, Stonebor, Inc., Houston, Tex.**

**Filed Feb. 27, 1981, Ser. No. 238,988**

**Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007788**

**Int. Cl.³ E21B *17/02***

**U.S. Cl. 166—243** **21 Claims**



1. A blast joint for a production tubing string comprising a section of tubing,

a plurality of abrasion-resistant rings surrounding the exterior of said tubing section which is to be subjected to the high velocity fluids flowing from a producing formation

into the annulus of the well bore through which said tubing section extends,

each of said rings including two sections having a semicylindrical body with a first axial edge and a second axial edge, a first inward facing tongue adjacent said first axial edge, a first inward facing groove spaced from said first axial edge by said tongue, a second outward facing tongue adjacent said second axial edge, a second outward facing groove spaced from said second axial edge by said tongue, said sections being assembled to form said rings so that the outward facing tongue of the second edge engages in the inward facing groove of the first edge and the inward facing tongue of the first edge engages in the outward facing groove of the second edge,

annular tongue and groove interconnecting means between each of said rings,

means secured around said tubing section and interengaging with the lower end of the lower of said rings to retain said ring from outward movement radially away from said tubing section, to support said rings on said tubing section and to protect the lower rings against damage during movement of the tubing section in the well bore, and

means secured around said tubing section and interengaging with the upper end of the upper of said rings to retain said ring from outward movement radially away from said tubing section, to retain said rings on said tubing section in engagement with each other and with said lower retaining means and to protect the upper rings against damage during movement of the tubing section in the well bore.

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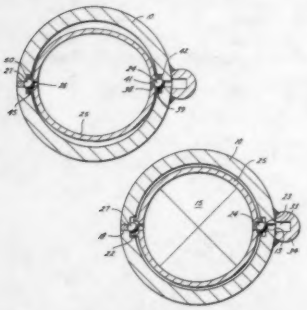
**4,381,822**

## LANDING NIPPLE

**Ernest P. Fisher, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.**

**Filed May 11, 1981, Ser. No. 262,472**
**Int. Cl.³ E21B *34/14***
**U.S. Cl. 166—326** **8 Claims**



3. A landing nipple comprising,

a tubular body having a bore therethrough,

an internal annular groove in the body,

a port between the groove and the exterior of the body,

a valve seat in said port,

an elastic ring in said groove,

means preventing relative rotation of said ring and body,

a first valve member on the ring cooperable with said valve seat to control flow through said port,

said ring when unstressed being oval in shape with the valve member at approximately the maximum diameter of the ring,

said ring dimensioned relative to the groove to be slightly bent by the body toward a circular configuration with the elasticity of the ring holding said valve member on said valve seat,

said ring bendable toward a circular configuration to unseat said valve member without stressing said ring beyond its elastic limits.

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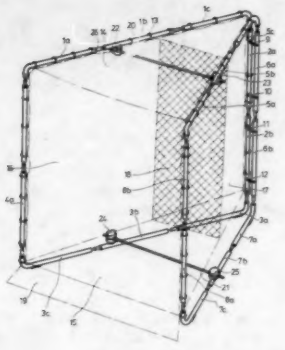
**4,381,823**

## COMBINATION FERTILIZER APPLICATOR AND TILLAGE IMPLEMENT WITH ADJUSTABLE SWEEP ASSEMBLIES

**William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.**

**Filed Feb. 23, 1981, Ser. No. 236,300**
**Int. Cl.³ A01B *49/02, 49/06***
**U.S. Cl. 172—155** **7 Claims**



1. A one-pass tillage, fertilizing and leveling apparatus comprising: an implement frame adapted to be pulled by a vehicle; subframe means; means for mounting said subframe means to said implement frame in a vertically adjusted position; a plurality of tillage tools mounted to one of said implement frame and subframe means; a plurality of fertilizer applicator knives mounted to the other of said implement frame and subframe means; said knives and said tools being laterally spaced and in cooperation such that both said knives and said tools till unbroken soil in strips of generally equal lateral spacing and without overlap; and leveling means mounted to said implement frame behind said tools and said knives for pulverizing and leveling the soil loosened thereby.

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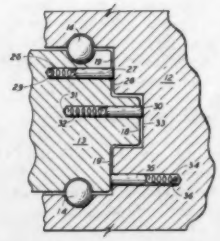
**4,381,824**

## DRILL BIT LUBRICATION SYSTEM

**Paul E. Pastusek, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.**

**Filed Oct. 3, 1980, Ser. No. 193,858**
**Int. Cl.³ E21B *10/22***
**U.S. Cl. 175—229** **8 Claims**



1. In a non-sealed rolling cutter drill bit having at least one bearing journal shaft and a rolling cutter rotatably mounted on the shaft and having at least one flat interior end face in rotary bearing contact with the end of said bearing journal shaft to support end thrust loads, the improvement comprising:

at least one lubricant rod slidably mounted in said shaft for

longitudinal movement therein and arranged to contact said flat interior end face of said rolling cutter; and,

biasing means associated with said lubricating rod and arranged to urge said rod against said flat interior end face during rotation of said rolling cutter to lubricate the end thrust bearing surfaces thereof.

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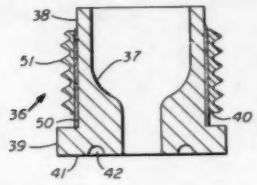
**4,381,825**

## DRILL BIT NOZZLE

**Robert P. Radtke, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.**

**Filed Aug. 27, 1981, Ser. No. 296,811**
**Int. Cl.³ E21B *10/60***
**U.S. Cl. 175—393** **22 Claims**




17. A removable nozzle member for use in earth drilling bits or other tools, comprising

a body portion formed of hard metal, selected from the group consisting of metal carbides, oxides, borides, nitrides and silicides, having a cylindrical exterior surface and an internal nozzle shaped passage extending longitudinally thereof,

a metal sleeve secured on said cylindrical surface and having male threads formed in the exterior surface thereof adapted to be secured in a threaded passage in a drill bit, and

an enlarged cylindrical end flange at an end of said body portion away from said threaded sleeve,

said threaded sleeve being adapted to be secured in a threaded opening in a metal body and said cylindrical flange being adapted to fit a counterbore in a metal body in sealing relation thereto and protecting said threaded sleeve portion against abrasive wear.

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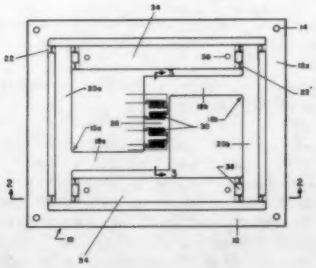
**4,381,826**

## WEIGHING SCALE OF UNITARY CONSTRUCTION

**Walter E. Kupper, Madison, N.J., assignor to Mettler Instrumente AG, Greifensee, Switzerland**

**Filed Oct. 27, 1980, Ser. No. 200,979**
**Int. Cl.³ G01G *3/14, 21/08***
**U.S. Cl. 177—211** **10 Claims**



1. In a weighing scale having load-receiving means and an elastically deformable measuring element, the improvement comprising

mechanical means intercoupled between said load-receiving means and said measuring element to create load-dependent deformations in said measuring element, said mechanical means comprising a frame, a first and second lever, and means for swingably connecting said first and second levers to said frame;

wherein each of said levers is T-shaped, each of said T's having a stem and a crossbar;

wherein said stem of said first T is arranged parallel to said stem of said second T and at a predetermined distance therefrom; and

wherein said measuring element is connected between said stems so that a load-dependent torsion is applied thereto.

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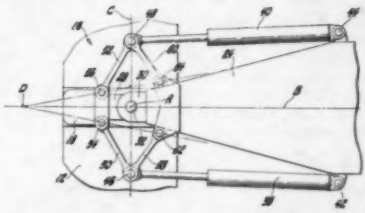
**4,381,827**

## STEERING MECHANISM FOR ARTICULATED VEHICLES

**Donald F. Blackmore, Wadsworth, and Rudolph Halmosi, Hudson, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 14,339, Feb. 23, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,191**
**Int. Cl.³ B62D *5/10***
**U.S. Cl. 180—139** **3 Claims**

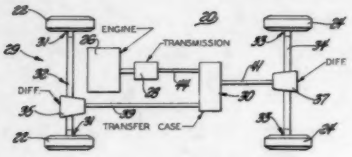


1. A steering mechanism for an articulated vehicle comprising first and second frame sections, means pivotally interconnecting said frame sections about a steering axis for relative steering articulation therebetween to either side of straight-ahead steering alignment of said frame sections; a pair of drive links and a pair of idler links; means connecting one end of one of said idler links and one end of the other of said idler links to said first frame section for pivotal movement about first and second pivot axes located on opposite sides of the longitudinal center axis of said vehicle when said frame sections are in straight-ahead steering alignment; means connecting one end of one of said drive links and one end of the other of said drive links to said second frame section for pivotal movement about third and fourth pivot axes located on opposite sides of said longitudinal center axis; means connecting the other ends of said idler links and the other ends of said drive links for relative pivotal movement about fifth and sixth pivot axes; a pair of fluid pressure-operated steering jacks located on opposite sides of said longitudinal center axis with one end of said steering jacks pivotally connected to said drive and idler links at said fifth and sixth pivot axes and the other end of said steering jacks pivotally connected to said first frame section, said pivot axes being so located that the distance between said first and second pivot axes is greater than the distance between said third and fourth pivot axes and a straight line passing through said steering axis and said fifth pivot axis or said sixth pivot axis is substantially perpendicular to said longitudinal center axis when said frame sections are in straight-ahead steering alignment whereby the return steering torque at 90° steer angle is at least equal to the steering torque at 0° steer angle.

## 4,381,828
## VEHICLE DRIVE SYSTEM HAVING FIRST AND SECOND OPERATING MODES AND METHOD OF OPERATING SAME

**Royston C. Lunn, Ann Arbor; J. Edwin MacAfee, Grosse Ile; Robert C. Grabowski, Dearborn Heights; Dennis N. Renneker, Troy, and John W. Winkler, Temperance, all of Mich., assignors to American Motors Corporation, Southfield, Mich.**

**Filed Nov. 13, 1980, Ser. No. 206,337**
**Int. Cl.³ B60K *17/34***
**U.S. Cl. 180—247** **12 Claims**




12. In a vehicle having a first set of wheels and a second set of wheels adapted to be driven from a source of power, a drive system comprising:

drive axle means, interconnecting the first set of wheels and including an axle shaft sectioned into first and second sections and a clutch collar associated with said sections and movable between first and second positions, for coupling the first set of wheels for cooperative rotation with the clutch collar in the first position, and decoupling the first set of wheels with the clutch collar in the second position;

transfer case means, interconnected among the source of power, the drive axle means, and the second set of wheels and including an interaxle differential and a clutch mechanism associated with the differential and shiftable between first and second positions, for transferring torque to the drive axle means through the differential with the clutch mechanism in its first position, and not transferring such torque with the clutch mechanism in its second position; and

control means, including first and second vacuum motors, associated with the drive axle means and the transfer case means, respectively, and responsive to first and second control signals, for responding to the first control signal to actuate the first vacuum motor to shift the clutch collar of the drive axle means to its first position to couple the first set of wheels and to actuate the second vacuum motor to shift the clutch mechanism of the transfer case means to its first position in a first predetermined automatic sequence to permit torque transfer to the drive axle means and for responding to the second control signal to actuate the second vacuum motor to shift the clutch mechanism to its second position to interrupt torque transfer to the drive axle means, and then to actuate the first vacuum motor to shift the clutch collar to its second position in a second predetermined automatic sequence to effect free rotation between the first set of wheels.

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## 4,381,829
## COLLISION DETECTION SYSTEM WITH SAFETY DEVICES

**Bernard Montaron, Toulouse, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France**

**Filed Oct. 20, 1980, Ser. No. 198,812**
**Claims priority, application France, Oct. 23, 1979, 79 26208**
**Int. Cl.³ B60R *21/02***
**U.S. Cl. 180—274** **8 Claims**

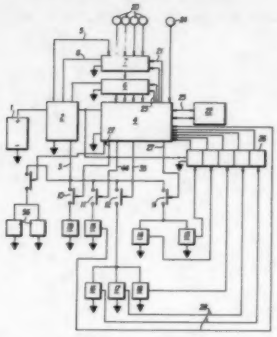
1. A system for detecting a collision in a vehicle, comprising:

a plurality of sensor means for providing measurements based on the vehicle's acceleration;

a plurality of passenger safety means which are controlled by pyrotechnic actuated devices triggered by the function of triggering resistors;

computer means for receiving data from said sensor means and operating said passenger safety means in accordance wih said data;

wherein said data is compared to levels recorded in the computer means and said passenger safety means are actuated if said levels are exceeded; and



testing means responsive to an output of said computer means for applying current for a short time to said triggering resistors so as not to trigger said devices wherein the current applied is equal in magnitude to the current which triggers said devices;

wherein the computer means operates in a manner to test the operation of the system and record any failures of operation.

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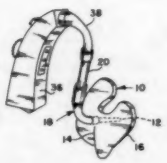
## 4,381,830
## CONTINUOUS FLOW EARMOLD TUBING CONNECTOR

**Chester J. Jelonek, Richmond, and Norman Schlagel, Fremont, both of Calif.**

**Filed Jul. 27, 1981, Ser. No. 287,237**
**Int. Cl.³ H04R *25/00***
**U.S. Cl. 181—129** **9 Claims**




1. A connector for connecting sound conduction tubing from a hearing aid to a sound conduction bore of an earmold, comprising:

an elbow-shaped member having a tubing-receiving section and a nubbin section;

said member having a sound conduction tubular passage extending from said tubing-receiving section to the outer end of said nubbin section;

said tubing-receiving section having a bore larger in diameter than said sound conduction tubular passage and slightly larger than the external diameter of the sound conduction tubing so that an end of the sound conduction tubing can be fitted therein, and, when the sound conduction tubing end is fitted within said tubing-receiving section, the internal diameter of the sound conduction tubing

is the same as that of said sound conduction tubular passage; and

said nubbin section defining latching means that is fitted into a section of a sound conduction bore of the earmold that has a complementary configuration as that of said latching means so that said nubbin section is latched within the section of the sound conduction bore and the diameter of the sound conduction bore at the outer end of said nubbin section is the same as that of said sound conduction tubular passage.

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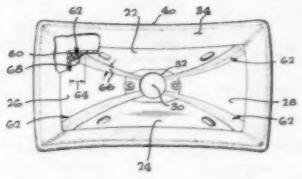
**4,381,831**

## HIGH FREQUENCY HORN

**Milton T. Putnam, Tarzana, Calif., assignor to United Recording Electronic Industries, Hollywood, Calif.**

**Filed Oct. 28, 1980, Ser. No. 201,548**
**Int. Cl.³ H05K *5/00***
**U.S. Cl. 181—152** **14 Claims**




1. A loudspeaker horn for coupling higher audible frequency sounds to the atmosphere, comprising:

a main housing in the form of a horn with a narrow end for receiving sound and a wide mouth end portion, most of the inner surface of said horn being substantially totally sound reflective; and

a buffer lying at the mouth end portion of the horn and forming the inner surface of the horn between the extreme mouth end and a location spaced from the extreme mouth end by a distance that is less than one half the length of the horn, said buffer inside surface being partially sound absorbing and having a coefficient of sound absorption of between 20% and 80% at a frequency of 2 Kilohertz along most of the inner surface area formed by said buffer.

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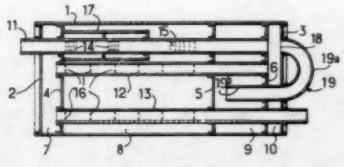
**4,381,832**

## EXHAUST SILENCER HAVING AN INCORPORATED RESONATOR FOR AN INTERNAL COMBUSTION ENGINE

**Jean Rauch, Bart, France, assignor to Automobiles Peugeot and Automobiles Citroen, both of Paris, France**

**Filed Sep. 8, 1981, Ser. No. 299,935**
**Claims priority, application France, Sep. 8, 1980, 80 19339**
**Int. Cl.³ F01N *1/02***
**U.S. Cl. 181—266** **4 Claims**




1. In an exhaust silencer for the exhaust gases of an internal combustion engine, comprising a case, an inlet pipe and an outlet pipe connected to the case, the case being formed by a lateral wall and two end walls defining at least a first reflection attenuation stage and at least a second stage constituting a Helmholtz resonator, formed by a chamber and a neck constituting a pressure take-off communicating with said first stage; the improvement wherein the chamber of the resonator is disposed inside said first stage and the pressure take-off of said second stage is formed adjacent one of said end walls of the case by means of a neck which extends through said one end wall and partly outside the case and re-enters the case and extends partly inside said first stage and is devoid of any connection to said inlet pipe and outlet pipe outside said case.

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**4,381,833**

## FLUID-OPERATED CLUTCH AND BRAKE DEVICES

**Pierre G. Foret, Falmouth, Mass., assignor to Foret Systems, Inc., Falmouth, Mass.**

**Filed Jul. 16, 1980, Ser. No. 169,411**
**Int. Cl.³ F16D *25/04***
**U.S. Cl. 192—85 V** **6 Claims**

1. An intermittent motion device for acting with rotational movement of a shaft and having a housing with said shaft passing through said housing

said shaft carrying a coupling disk fixedly mounted thereon with the disk comprising a resilient material capable of elastically deflecting under a force created by fluid pressure,

a wall carrying a friction ring means spaced from the disk and defining a chamber on one side of the disk with the chamber being open to the atmosphere in one position of the disk and means for changing the fluid pressure in said chamber to cause said disk to flex whereby said last-mentioned means causes engagement or disengagement of an outer annular ring portion of said disk with a coupling surface of said friction ring means to couple said shaft to said wall,

said disk being stepped and varying in thickness at each step radially of a central portion thereof to said annular ring portion whereby said outer annular ring portion flexes to a greater degree than other portions of said disk under pressure,

said friction ring means defining an L-shaped annular recess further defining a first friction ring annular wall extending coaxially of the axis of said shaft with a second annular ring wall transverse to the axis of said shaft acting as said coupling surface,

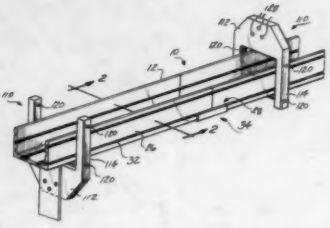
said coupling disk being mounted so as to flex within said recess and engage said coupling surface without engaging said first friction ring annular wall,

said disk having an outer edge spaced from said first friction ring annular wall by a predetermined amount which remains constant over long periods of use to provide a constant gap for fluid flow.

## 4,381,834
## MODULAR CHUTING

John T. Leisenger, Pontiac, Mich., assignor to Modular Automation, Inc., Clarkston, Mich.

Filed May 20, 1981, Ser. No. 265,664
Int. Cl.³ B65G 11/16, 13/00
U.S. Cl. 193—35 J 8 Claims



1. In a modular chute for passing a workpiece therealong comprising:

a chute having a U-shaped cross-section including a bottom wall with an inside surface and an outside surface, a pair of opposed side walls with an inside surface and an outside surface, and an open top;

a joining means for abutting and securing a plurality of chutes into a liquid tight continuous member;

means for securing a wear-resistant member to the walls of the chute;

means for aligning said plurality of chutes; and

an adhesive for securing said plurality of chutes one to another; the improvement wherein said joining means comprises:

a pair of opposed grooves formed in the opposed side walls disposed longitudinally along the side wall outside surface;

a U-shaped coupling member comprising a coupling bottom wall and a pair of opposed upright walls integral with the coupling bottom wall, said upright walls including an upper edge, a bead snugly engageable with said opposed grooves formed along the upper edge; and

whereby a pair of chutes with abutting ends are secured at the abutting ends to form a continuous member with said coupling member abutting said outside surfaces of said chute bottom wall and opposed side walls.

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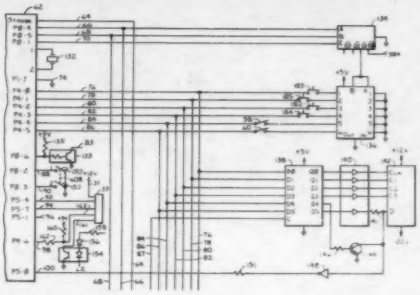
## 4,381,835
## CONTROL DEVICE

Hasmukh R. Shah, Hot Springs, Ark., and Ashok K. Gupta, Fairport, N.Y., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Apr. 4, 1980, Ser. No. 137,524
Int. Cl.³ G07F 5/22
U.S. Cl. 194—1 N 14 Claims

1. A control device, for a vending machine which has a plurality of customer-operated selection switches and which has a plurality of money-sensing elements that respond to the insertion of money to provide credit-establishing signals, and which comprises a memory that has a plurality of locations therein wherein data can be stored, a data processing means, and data change switch means that are actuatable by a route man, said control device being located within said vending machine and thereby disposing said data change switch means within said vending machine, said data processing means being adapted to respond to signals from said data change switch means to change data in various of said plurality of locations within said memory, said control device and said vending machine having a first mode wherein actuation of said selection switches can enable said data processing means to effect the dispensing of products and having a second mode wherein actuation of said data change switch means can cause said data processing means to change data in said plurality of locations within said memory, said selection switches being actuatable, whenever said control device and said vending machine are in said first mode, to supply signals to said data processing means which said data processing means will utilize to determine whether products corresponding to said selection means can be vended, said data change switch means being actuatable, whenever said control device and said vending machine are in



said second mode, to supply signals to said data processing means which said data processing means will utilize to change said data in various of said plurality of locations within said memory, and said data processing means responding to a credit-establishing signal from one of said money-sensing elements to automatically take said control device and said vending machine out of said second mode to enable said control device and said vending machine to operate in said first mode.

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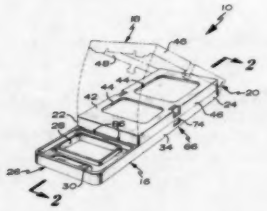
## 4,381,836
## ANTI-THEFT POINT-OF-SALE CONTAINER

Eric M. Rivkin, Minnetonka, and Stanley R. Thorud, Brooklyn Center, both of Minn., assignors to Liberty Diversified Industries (Shamrock), Minn.

Filed Jun. 15, 1981, Ser. No. 273,667
Int. Cl.³ B65D 85/672
U.S. Cl. 206—387 49 Claims



1. An anti-theft point-of-sale container for tapes, the container comprising:

a body, said body having a cavity therein of a width at least as great as the length of a cassette, said cavity having a length at least twice the thickness of a cassette, said body comprising first and second ends and first and second side walls;

a handle attached to said body first end;

at least one hinge member, hingedly attached to said body second end;

a cover comprising first and second ends hingedly attached at said cover second end to said hinge member and third and fourth side walls, said cover having a cavity therein complementary to said body cavity and having a length and width substantially equal thereto; and

means for permanently securing said cover to said body, said securing means comprising:

at least one tab means extending from said second end of one of said body and said cover, each said tab means having barb means on at least one side thereof;

first and second slot walls extending between said side walls of the other of said body and said cover, said slot walls being connected by at least one web means intermediate said side walls, said slot walls being of a depth and thickness so as to prevent substantial distortion due to manual manipulation from the exterior of said container.

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**4,381,837**

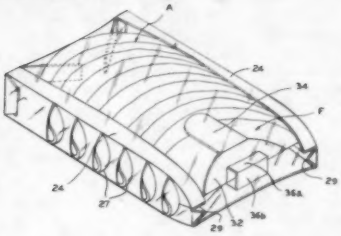
**PROTECTIVE TRAY**

**Jeff J. Cortopassi, Santa Ana, Calif., assignor to Container Corporation of America, Chicago, Ill.**

**Filed Mar. 2, 1981, Ser. No. 238,158**

**Int. Cl.³ B65B *23/00*; B65D *73/00***

**U.S. Cl. 206—485** **3 Claims**



1. A tray, formed from a unitary blank of foldable paperboard, for holding a plurality of packaged, fragile articles, such as taco shells, in a nested relationship, comprising:

(a) a bottom wall having an end wall and pair of side walls foldably joined to and upstanding from opposed end and side edges thereof to form a tray-like structure;

(b) a plurality of longitudinally spaced opending disposed in said side walls for receiving and retaining opposed end portions of said packaged articles in spaced relation;

(c) a pair of relatively narrow, elongated support panels hingedly attached to said end wall adjacent opposite ends thereof, said support panels foldable inwardly from the end wall to be received within portions of the end-most packaged articles to maintain them in position and to prevent them from being crushed; and

(d) means foldable out of said bottom wall for supporting other portions of said packaged articles.

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**4,381,838**

**SUPPORT SYSTEM FOR POTTED PLANTS**

**Joseph D. Boogaart, 1048 N. Ustler Rd., Apopka, Fla. 32703**

**Filed Nov. 21, 1980, Ser. No. 208,865**

**Int. Cl.³ A47F *7/00***

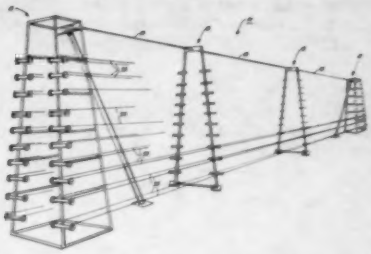
**U.S. Cl. 211—71** **10 Claims**

1. An apparatus for supporting a plurality of plants in flanged pots off the ground comprising

a plurality of wire sets each comprising two substantially parallel horizontally disposed flexible wires;

means coupled to each flexible wire for providing tension to the wire and rendering the wires rigid in a vertical direction;

a plurality of means disposed at predetermined intervals for bearing vertical loads due to the weight of the potted plants; and



means for bearing a horizontal load due to the tension on the wires, whereby the flanged pots are supported by the parallel wires.

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**4,381,839**

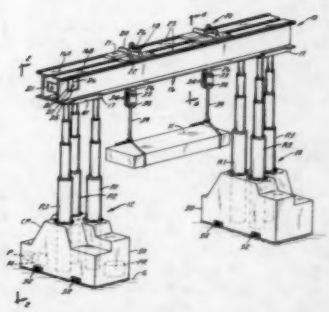
**GANTRY HAVING ADJUSTABLE SIDE SUPPORTS**

**Edgar D. Engler, Willow Springs, and Gary V. Lorenz, Moline, both of Ill., assignors to Riggers Manufacturing Co., Bettendorf, Iowa**

**Filed Mar. 2, 1981, Ser. No. 239,318**

**Int. Cl.³ B66C *11/00***

**U.S. Cl. 212—208** **6 Claims**



1. A gantry for straddling a load and for raising, supporting and lowering the same comprising:

a pair of spaced apart support assemblies, each support assembly comprising a stationary base portion and three vertically disposed independently extendable/retractable hydraulic rams mounted on said base portion in triangular relationship to one another;

a pair of tiltable sole plates, each tiltable sole plate being mounted on the upper ends of the three rams of a support assembly;

means for connecting the upper end of each ram to its associated sole plate and including universal joint means and releasable attachment means;

a load-supporting gantry beam extending between said spaced apart support assemblies and comprising a pair of beams arranged in spaced apart side-by-side relationship supported on said pair of sole plates;

a load lifting link assembly mounted on said gantry beam and comprising link support means mounted on said pair of spaced apart beams and link means connected to said link support means and extending downwardly between said pair of spaced apart beams;

said spaced apart beams being maintained in spaced apart side-by-side relationship with each other by means of said sole plates and said lifting link assembly;

and selectively operable control means operatively connected to said hydraulic rams and operable to effect extension/retraction of all of said hydraulic rams in unison to raise and lower said gantry beam and to effect extension/-retraction of individual or predetermined combinations of said hydraulic rams to level said gantry beam.

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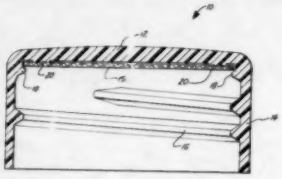
**4,381,840**

## THREADED CLOSURE WITH FREE-FLOATING LINER

**Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Richmond, Va.**

**Filed Aug. 24, 1981, Ser. No. 295,576**
**Int. Cl.³ B65D *41/04***
**U.S. Cl. 215—329** **19 Claims**



1. A thermoplastic closure for fitment to a container having a threaded neck terminating in a lip which defines an open mouth, said closure comprising:

a. a circular top wall;

b. an annular skirt downwardly depending from said top wall, said skirt having about its inside surface a closure thread for cooperation with said neck thread to achieve said fitment;

c. a circular, flexible liner positioned adjacent said top wall and having a diameter substantially equal to the outside diameter of said lip, said liner being freely rotatable with respect to said closure, and a plurality of studs radially displaced from the center axis of said closure whereby said studs will overlie said container lip when said closure is fitted to said container, said studs having a height such that said studs, prior to the tightening of said closure to said container, do not substantially interfere with said free rotation of said liner but that said studs penetrate the surface of said liner subsequent to said closure being tightened to said container so that said liner is no longer freely rotatable with respect to said closure.

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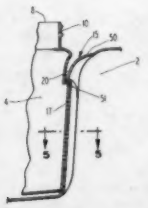
**4,381,841**

## INTERLOCKING ARRANGEMENT FOR PLASTIC CONTAINERS

**Howard H. Schwarz, Moorestown, N.J., assignor to Contour Packaging Corporation, Philadelphia, Pa.**

**Filed Nov. 9, 1981, Ser. No. 319,380**
**Int. Cl.³ B65D *25/08, 21/02***
**U.S. Cl. 220—23.4** **4 Claims**



1. In a container system comprising a plurality of plastic containers of predetermined volumes, the system being suitable for storing chemicals and pouring said chemicals into a machine, the improvement which comprises:

an interlock for snapping a first of said containers onto a second of said containers, the interlock comprising a male portion disposed on the first container and a female portion disposed on the second container, the female portion having a contour shaped to coincide substantially with the contour of the male portion, each part of the male portion having a counterpart in the female portion,

the male portion comprising a curved protrusion and a tapered flange, the protrusion and the flange being adjacent to each other, and wherein the protrusion overhangs the flange,

the curved protrusion comprising a curved surface and a straight surface, the surfaces intersecting at an acute angle and along a line spaced sufficiently away from the body of the container such that the curved protrusion can be hooked onto its counterpart in the female portion of the container,

the tapered flange having a width which increases with the distance away from the curved protrusion, the width of the flange also increasing with the distance from the container, wherein the tapered flange on the male portion is capable of being snapped onto its counterpart in the female portion of the container,

wherein the curved protrusion and the tapered flange are capable of being matably attached to their respective female counterparts.

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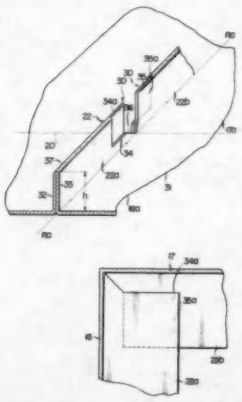
**4,381,842**

## METAL ENCLOSURE AND MANUFACTURING METHOD THEREFOR

**Syuichi Dezawa, Komae, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jul. 9, 1980, Ser. No. 167,000**
**Claims priority, application Japan, Jul. 17, 1979, 54-89819**
**Int. Cl.³ B65D *6/38;* B62K *31/02***
**U.S. Cl. 220—72** **6 Claims**



1. A metal enclosure having a left side wall, a top wall, a right side wall, and a bottom wall wherein:

at least two adjacent walls among said four walls are formed by folding a single plate as a starting material along predetermined folding lines to form substantially a right angle,

at least one closed U-shaped rib extends inwardly of said metal enclosure from each said wall, said rib being folded along a predetermined rib extending base line, and lying substantially perpendicular to said folding line,

each said rib has two rib walls which are fixed to each other, ribs each formed to walls at both sides of said folding lines are fixed to each other at front ends thereof,

said front ends of said ribs are so formed that the front end of one of the two rib walls is cut away so that the front end of the other of said two walls protrudes longer in the longitudinal direction of the rib than the the front end of said one of said walls, and the protruded part of said other rib wall of each rib can be fitted with the protruded part of said other rib wall of its paired rib opposite said folding line, and

the fixing of the front ends of said ribs is accomplished by fixing said protruded and fitted rib walls.

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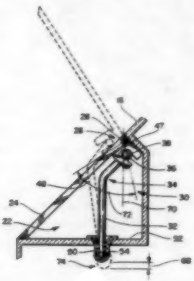
**4,381,843**

## CLOSURE PANEL RETENTION MEANS

**Joseph N. Marchese, Norridge, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**

**Filed Dec. 31, 1981, Ser. No. 336,157**
**Int. Cl.³ B65D *43/24***
**U.S. Cl. 220—335** **4 Claims**



1. An apparatus for the positive retention of a closure panel alternately in an open position or a closed position with respect to a compartment, said panel being attached to said compartment by pivot means for closing said compartment, the apparatus comprising:

push rod means;

crank pin means attached to and extending from said panel in parallel with said pivot means but off-set therefrom for rotatively capturing an end of said push rod means;

resilient pocket means cupped in an adjacent inner wall of said compartment for receiving the distal end of said push rod means;

such that as said panel is alternately opened or closed, the intermittent rotary-to-reciprocal motion of said crank pin/push rod means causes said crank pin means to rotate past the dead center of pivot means against the restorative force of said resilient pocket, with the subsequent contraction of said pocket providing for positive retention of said closure panel in an open or closed position.

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**4,381,844**

## LID SEAL FOR NUCLEAR WASTE CONTAINERS

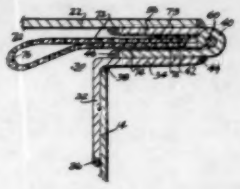
**Ferdinand H. Bondy, 1916 S. Washington St., Tacoma, Wash. 98405**

**Filed Aug. 7, 1981, Ser. No. 290,842**
**Int. Cl.³ B65D *53/00***
**U.S. Cl. 220—378** **7 Claims**

1. In a metallic container for withstanding the rigors of transport, storage and burial of nuclear waste material, for example, a lid-to-top edge joint construction, comprising:

means providing a horizontal surface around the upper edge of said container;

a lid having a planar surface substantially coextensive with said horizontal surface and disposed thereover;



a folded strip of flexible gasketing material interposed between said surfaces and having the fold thereof within said container; and

means securing the periphery of said lid to said container.

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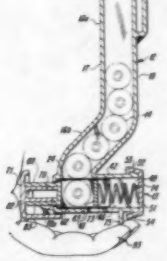
**4,381,845**

## DISPENSER FOR SHOTGUN SHELLS

**Mark J. Feis, 14381 Riverdale Rd., Brighton, Colo. 80601**

**Filed Oct. 14, 1980, Ser. No. 196,434**
**Int. Cl.³ F42B *39/00***
**U.S. Cl. 221—185** **4 Claims**



1. A dispenser for shotgun shells and the like comprising:

a supply housing of generally rectangular shape having a front wall, a rear wall, and opposed sidewalls with inner surfaces defining an elongated supply passage of a size and shape related to the size and shape of the shells being dispensed to guide a stack of the shells downwardly from a top fill opening through a bottom opening, said supply housing being formed with a straight upper section and a forwardly and downwardly inclined lower section, a closure lid for said fill opening having a generally channel-shaped cross section with a pair of side flanges that turn in from the sides of the lid and slide under a pair of outward flanges projecting out from the top of the sidewalls of the supply housing, said lid having a stop flange at one end that extends down along one side wall, a catch flange at the opposite end, and an up-standing lip projecting up from said catch flange whereby upon the application of a force to said lip the fastening flange is raised to a position to enable the movement of the lid to an open position;

an ejecting housing of generally rectangular shape having a top wall, a bottom wall and opposed sidewalls having inner surfaces defining an ejecting passage, there being an opening in the top wall to receive a shell from the bottom of the supply housing and a release opening in the bottom wall, said ejecting housing having an opening in the front, an opening in the rear, and a removable rear end cap closing the rear opening;

an ejecting member slidably mounted in and guided by the

inner surfaces of said ejecting housing, said ejecting member being in the form of an open grid-like frame and having a front wall, a rear wall, and opposed sidewalls defining a shell-receiving cavity that in its forward position is under the open bottom of the supply housing, said sidewalls extending beyond said rear wall, said ejecting member having a forward extension projecting through the opening in the front wall and shaped to form a receiving socket, and an actuator mounted on the front end of said ejecting member externally of said ejecting housing adapted to be emgaged by the hand of the user to move said ejecting member to the second position, said actuator having a forward upright leg and a lower rearwardly extending leg disposed to extend under said ejecting housing in the second position; and

resilient means mounted in said ejecting housing between said rear end cap and the rear wall of said ejecting member for automatically returning said ejecting member from said second position to said first position after a shell-dispensing operation with the then lowermost shell in the supply housing dropping into said cavity in the first position for said ejecting member.

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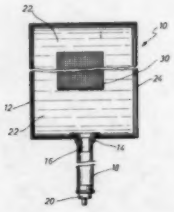
**4,381,846**

**REFILL WITH FLEXIBLE MESH SCREEN FOR LIQUID DISPENSER**

**Samuel C. Heck, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.**

**Filed Dec. 10, 1980, Ser. No. 214,977**
**Int. Cl.³ B65D *37/00***
**U.S. Cl. 222—105** **15 Claims**



**1.** An apparatus for dispensing liquid comprising:

a housing;

a reservoir for storing said liquid disposed within said housing,

said reservoir having a fitment welded thereto for providing an outlet port for said liquid;

a tubular member connected to said fitment, for selectively dispensing said liquid; and

a mesh screen disposed in a first position freely suspended and movable within the liquid in said reservoir, and upon the liquid being dispensed from the reservoir, the mesh screen is freely movable to a second position overlying the fitment and producing flow channels between said reservoir and said fitment, for said liquid to continuously empty into said tubular member.

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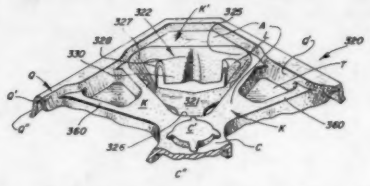
**4,381,847**

**CARRY-OUT TRAY**

**Clifford H. Bessett, South Holland, and Theodore H. Misdom, Lansing, both of Ill., assignors to Packaging Corporation of America, Evanston, Ill.**

**Continuation-in-part of Ser. No. 248,699, Mar. 30, 1981, abandoned. This application Jul. 6, 1982, Ser. No. 395,273**
**Int. Cl.³ B65D *1/34, 1/36***
**U.S. Cl. 229—2.5 R** **17 Claims**

**1.** A molded carry-out tray for accommodating cup-shaped containers varying in size within a predetermined range, said tray comprising a continuous raised peripheral rim delimiting an area, at least one recessed pocket formed in said area for removably accommodating and maintaining a container in an upright position while said tray is disposed in a substantially horizontal plane, said pocket including a base section for subtending and supportingly engaging the bottom of an accommodated container; walls extending divergently upwardly from said base section and terminating at a predetermined elevation with respect to said base section, said rim having a top disposed at a greater elevation from said base section than the upper termination of said pocket walls; and corner sections intermediate said walls and interconnecting corresponding portions of adjacent walls, said corner sections being connected to peripheral segments of said base section and extending upwardly



therefrom, said corner sections terminating at substantially the same elevation as said walls, said walls and corner sections coacting to define an open top; each wall being provided with an upper segment integrally connected to adjacent corner sections, and an outwardly yieldable lower segment having a lower edge disposed adjacent to, but spaced from, the periphery of said base section, said lower segments having side edges extending upwardly from opposite ends of said lower edge, said side edges being spaced from corresponding side portions of the adjacent corner sections, each corresponding side portion of a corner section being provided with an inwardly offset ledge, said ledge being spaced from the open top of said pocket.

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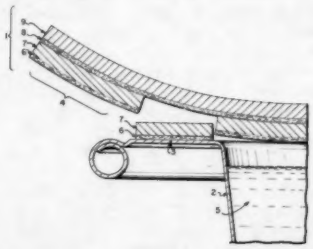
**4,381,848**

**MEMBRANE CLOSURE STRUCTURE**

**Merle S. Kahn, Richmond, Va., assignor to Reynolds Metals Company, Chesterfield County, Va.**

**Filed Jul. 1, 1981, Ser. No. 279,592**
**Int. Cl.³ B65D *43/02, 51/20***
**U.S. Cl. 229—43** **10 Claims**



**1.** A membrane closure for a container, said membrane closure being heat sealable to said container, said membrane closure being capable of removal from said container by peeling under hand pressure and said membrane closure being capable of withstanding retort sterlization, said membrane closure comprising a first adhesive layer, an intermediate metallic foil or paper layer having one side thereof bonded to said first adhesive layer, a second adhesive layer having one side thereof bonded to the other side of said intermediate layer and a barrier metallic foil or paper layer having one side thereof

bonded to the other side of said second adhesive layer, said intermediate layer having a tear strength less than the bond strengths of said first adhesive layer and said second adhesive layer, said second adhesive layer having a bond strength less than the bond strength of said first adhesive layer and said barrier layer having a tear strength greater than the tear strength of said intermediate layer and greater than the bond strengths of said first adhesive layer and said second adhesive layer, whereby upon peeling of said membrane closure from said container initial failure occurs within said intermediate layer and secondary failure occurs between said second adhesive layer and said intermediate layer, along a heat seal between said membrane closure and said container.

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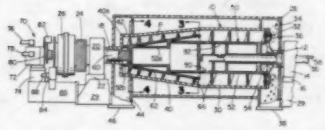
**4,381,849**

## SOLIDS-LIQUID SLURRY SEPARATING CENTRIFUGE

**Lawrence D. Conant, West Bridgewater, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.**

**Filed Jun. 29, 1981, Ser. No. 278,081**
**Int. Cl.³ B04B *1/20***
**U.S. Cl. 494—43** **8 Claims**



1. In a solids-liquid separating centrifuge having a rotary bowl, a rotary conveyor mounted coaxially therein, means for rotating said bowl and conveyor about their common axis in the same direction at a differential speed, means for feeding a solids liquid slurry into said bowl, an outlet for solids at an end portion of said bowl, and a separate outlet for liquid from said bowl constructed and arranged to permit the formation in said bowl of a pool of said slurry having its surface at least approximately as close to the bowl axis as said solids outlet;

solids discharge mechanism for discharging solids through said bowl end portion to said solids outlet comprising a frusto-conical interior in said bowl end portion having its smaller diameter end at said solids outlet, a frusto-conical, helically bladed hub on said conveyor located coaxially within, and extending substantially the full length of, said frusto-conical interior and having a larger cone angle such as to define with said interior a frusto-conical passage which, at its smaller diameter end, is wider than at its larger diameter end and is approximately equal in cross-sectional area to its larger diameter end, said hub being helically bladed by at least one helically extending blade mounted on said hub to define a helix which has a diminishing spacing between successive turns thereof about said common axis from the larger diameter end toward the smaller diameter end of said passage.

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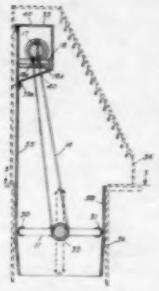
**4,381,850**

## AUTOMATIC AIR REGISTER DAMPER

**Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228**

**Filed Oct. 16, 1981, Ser. No. 312,339**
**Int. Cl.³ F24F *13/10***
**U.S. Cl. 236—11** **10 Claims**

1. Means for controlling the air flow through individual ducts which transport said air to separate rooms of a multiple room dwelling from a furnace, air-conditioning equipment or like devices and where each said duct has installed in its open ended termination an automatic damper means comprised of a damper housing, noise suppression and cushioning means attached to longitudinal edges of a damper plate for quietly arresting said damper plate pivotally mounted in the damper housing and movable between a closed position, thereby placing said cushioning means against front and rear panels of said damper housing, and an open position which allows substantially unrestricted flow through said duct, rotatable damper support means inserted in holes in end panels of said housing, DC solenoid motor means including cable means that implements rotational movement of a damper shaft attached to said damper plate for opening and closing said damper plate at the command of thermostatic control means, means for rectifying alternating current, said thermostatic control means regulating the combustion cycle of a furnace of like device and causing the motor means to be energized simultaneously with said furnace or like device whereupon said motor means influence rotation of damper plate from a closed position to an open position when the fuel control means are energized and from an open to a closed position when said furnace or like device is de-energized, or when said thermostat control means closes, a dual switch means having switch actuators operated by trans-



lational movement of a multi-diametered solenoid plunger common to a set of dual solenoids comprising the aforesaid DC solenoid motor means such that a switch actuator of a normally closed switch of said dual switch means is moved by said plunger to change said normally closed switch to an open switch condition whenever the damper plate is rotated from an open to a closed position or vice versa, the closed switch being a requisite condition for said switch means to establish a closed circuit thereby enabling the furnace or like device to initiate a heating or cooling cycle, and immediately after start of the heating or cooling process, the solenoid plunger moves said switch means actuator to create an open switch condition and de-energization of the previously energized solenoid, and energizes a time delay means that delays closing of the damper plate in the last room to be heated or cooled in said multiple room dwelling until said heating or cooling cycle is complete.

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**4,381,851**

## TRACK SPLICE

**Joseph K. Kraft, Parsippany, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Mar. 11, 1981, Ser. No. 242,753**
**Int. Cl.³ E01B *25/00*; B65G *21/14***
**U.S. Cl. 238—232** **11 Claims**

1. An adjustable length, self-aligning, smoothly continuous track splice, comprising:

first and second track sections having ends to be adjustably spaced and wheel support surfaces to be aligned,

first and second finger members each having first and second ends, a wheel support surface extending between their ends, a surface opposing said wheel support surface, and first and second side portions disposed between said wheel support and opposing surfaces,

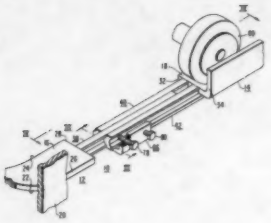
means fastening the first end of said first finger member to the end of said first track section such that its second end extends outwardly therefrom, with their wheel support surfaces in alignment,

means fastening the second end of said second finger mem-

ber to the end of said second track section such that its first end extends outwardly therefrom, with their wheel support surfaces in alignment,

said first and second finger members having like cross-sectional configurations, with their first side portions each having a longitudinally extending tongue and their second side portions each having a longitudinally extending groove,

said first and second finger members being disposed in contacting side-by-side relation, with the tongue and grooves being dimensioned such that the tongue on one finger member snugly enters the groove of the other finger member to longitudinally align said first and second finger members, to allow relative sliding movement therebetween in a direction between their ends, while resisting



relative movement in any other direction, to enable the ends of said first and second track sections to be spaced by a selected dimension, while maintaining the wheel support surfaces of said first and second track sections and said first and second finger members in a common plane, and to provide a free groove on one outer side of the resulting assembly, and a free tongue on the other,

and clamping means for adjustably clamping the adjoining surfaces of said first and second finger members tightly together,

said clamping means including means for entering and contacting the surface of said free groove on the outside of the assembled finger members, to maintain the selected dimension between the ends of said first and second track sections.

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**4,381,852**

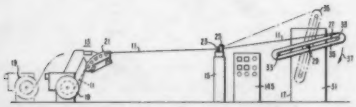
## AUTOMATIC TENSIONING CONTROL FOR WINDING STATOR COILS

**Herbert E. Ferree, Hempfield Township, Westmoreland County, and Dirk J. Boomgaard, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 198,495, Oct. 20, 1980, abandoned, which is a continuation of Ser. No. 6,834, Jan. 26, 1979, abandoned. This application May 6, 1982, Ser. No. 375,605**

**Int. Cl.³ H02K *15/04*; H01F *41/04*; B65H *81/00***

**U.S. Cl. 242—7.13** **5 Claims**



1. A device for winding loops for stator coils comprising:

looper means for winding lengths of wire into loops of stator coil;

dereeler means including a wire-storage reel for unreeling a length of wire to the looper means;

tension-sensing means between the dereeler means and the looper means for measuring tension on the wire and for providing a voltage signal;

the tension-sensing means comprising a pivotally-mounted lever on which a plurality of longitudinally and closely spaced wire-supporting pulleys are mounted, the pulleys being disposed on centers in an arcuate path having a radius on the side of the wire opposite the radius of the reel to effect reverse bending of a wire as it moves from the reel to the looper means along a plane of travel;

tension-control means connected to the dereeler means and responsive to the tension-sensing means for controlling tension on the wire;

means for receiving the voltage signal comparing it with a voltage for a predetermined tension load and transmitting a resulting voltage signal to the tension-control means;

a lever-support frame mounted adjacent to the path of travel of the wire and being pivotally mounted on an axis that is in said plane of travel; and

the lever being pivotally mounted on the frame and on an axis that is substantially normal to said plane of travel.

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**4,381,853**

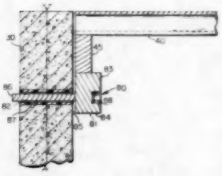
## ALIGNMENT APPARATUS

**Giacomo F. Michienzi, 282 Old Bedford Rd., Concord, Mass. 01742**

**Filed Dec. 29, 1980, Ser. No. 220,354**

**Int. Cl.³ E04G *17/04, 17/14***

**U.S. Cl. 249—205** **1 Claim**



1. An alignment apparatus for use in erecting shelter structures, said apparatus comprising an eccentrically-shaped cam portion having an endless cam surface extending between first and second faces, a shaft portion extending outwardly from said second face of said cam portion, recess means disposed in said first face of said cam portion, said recess means being in alignment with the axis of said shaft portion, and a sleeve member adapted to receive said shaft portion and adapted to be embedded in a formed, vertical wall, said cam portion second face being disposed proximate to and parallel with a surface of said vertical wall, and normal to said sleeve member, when said shaft is disposed in said sleeve member, said cam surface being adapted to receive and support a portion of a horizontal member, said recess means being adapted to receive a complementarily-shaped tool, whereby said cam portion may be rotated by use of said tool to rotate said shaft portion in said sleeve member and to selectively locate said cam surface relative to said horizontal member and thereby selectively locate said horizontal member relative to said vertical wall member.

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**4,381,854**

## GUIDE BAR FOR CUTTING TORCH

**Harry E. Bruner, 27 Meadow La., Apt. #5, Bridgewater, Mass. 02324**

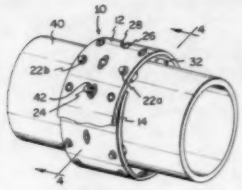
**Continuation-in-part of Ser. No. 120,713, Feb. 11, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 244,147**

**Int. Cl.³ B23K *7/04***

**U.S. Cl. 266—54** **4 Claims**

1. A guide bar for a cutting torch, the guide bar comprising a flexible base portion and a locking means, the base portion having a first terminal end, a second terminal end, a horizontal plane, a first long edge having a guide element extending

therefrom and a series of apertures and least one slot, the apertures and slot having vertical axis formed in right angle relation to the horizontal plane, the locking means including a first fastener element and a moveable grommet fitted into the slot, the moveable grommet engaged to the base portion and



the first fastener element comprising an externally threaded stud attached to the base portion in close proximity to the first terminal end, the base portion having at least two spacer elements engaged thereto, the spacer elements spaced from each other and each of them including a magnet.

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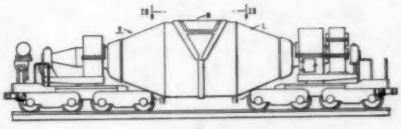
**4,381,855**

**TECHNIQUE FOR CONSERVING HOT METAL TEMPERATURE**

**John P. Ryan, Munhall, Pa., assignor to Industrial Machine Works, Inc., Murrysville, Pa.**

**Filed May 6, 1981, Ser. No. 261,288**
**Int. Cl.³ F27D *3/00***
**U.S. Cl. 266—248** **10 Claims**



1. In a hot metal processing system including a containment for transporting hot metal, said containment having an opening to permit the pouring of the hot metal into said containment at a first process station and the subsequent removal of said hot metal from said containment at a second process station, the improvement for reducing the temperature loss from said containment, said improvement comprising,

a multi-layer, flexible thermal insulating cover means for positioning over said opening, said multi-layer flexible thermal insulating cover means comprised of at least one flexible thermal insulating element and at least one flexible screen element.

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**4,381,856**

**METHOD OF REPAIRING BLAST FURNACE WALL LINING**

**Akihiko Inoue; Hirofumi Inoue; Tsuyoshi Nakamura; Seiji Tobino, and Masamitsu Baba, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Jul. 9, 1982, Ser. No. 396,861**
**Claims priority, application Japan, Jul. 9, 1981, 56-106202**
**Int. Cl.³ F27D *1/16***
**U.S. Cl. 266—281** **5 Claims**

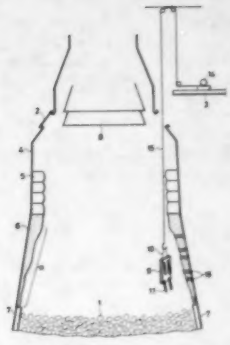
1. A method of repairing the wall lining of a blast furnace comprising the steps of:

blowing down the blast furnace after lowering the burden therein to below the damaged part of the lining;

making, after the blowing down, a plurality of openings and a refractories filling aperture through the furnace wall in the damaged part;

lowering a panel of refractory material through an opening in the furnace top to a position opposite to the damaged part;

drawing outside the furnace through one of said openings one end of a string-like member whose other end is attached to said panel, the entire length of the string-like member being



protected and stretched through a support tube passed through said openings; and

supplying, under pressure, monolithic refractories through said filling aperture into a clearance between the damaged part and panel either during blowing down or after blowing in.

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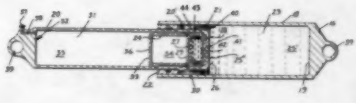
**4,381,857**

**PROGRAMMED OLEO-PNEUMATIC SHOCK ABSORBER**

**William C. Cook, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.**

**Filed Dec. 8, 1980, Ser. No. 214,217**
**Int. Cl.³ F16F *9/18, 9/50***
**U.S. Cl. 267—64.15** **5 Claims**



1. A programmed oleo-pneumatic shock absorber for the interconnection of two relatively movable members comprising:

an outer cylindrical housing terminating at one end in a closure wall;

a first hollow cylindrical piston slidably mounted in the other end of said outer cylindrical housing for telescoping movement internally thereof, said piston terminating at opposite ends in closure walls;

attachment means carried by the opposite outer ends of said housing and said first piston, one said attachment means adapted for connection to one of said relatively movable members and the other said attachment means adapted for connection to the other of said relatively movable members;

a pair of bearings, one carried internally by said housing adjacent its said other end and one carried externally by said piston adjacent its end internally of said housing to facilitate the movement of said housing and said piston and to define an annular chamber therebetween;

at least one passage of predetermined size piercing the bearing carried by said piston end to establish communication between the interior of said housing and said annular chamber;

a check valve associated with each said passage to restrict

fluid flow between the interior of said housing and said annular chamber;

a second hollow cylindrical piston transversely filling, and slidably mounted on and against the inner wall of, said first piston for movement relative to said first piston and said housing, said second piston terminating at opposite ends in closure walls;

a slidable bulkhead mounted internally of said second piston;

a predetermined quantity of relatively incompressible fluid within said housing, said annular chamber and the ends of said first and second pistons on the side of said slidable bulkhead adjacent said one housing end;

a predetermined quantity of relatively compressible fluid within the ends of said first and second pistons on the other side of said slidable bulkhead; and

an orifice of predetermined size in the closure wall adjacent the aforesaid telescoping end of said first piston and an orifice of small size relative to said predetermined size in each of said closure walls of said second piston, whereby an initial displacement of said second piston occurs with virtually no displacement of said bulkhead relative to said second piston upon movement of said two relatively movable members and subsequently a measurable displacement of said bulkhead relative to said second piston occurs allowing additional movement of said two relatively movable members.

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**4,381,858**

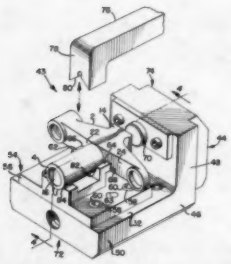
## FLUID OPERATED WORKHOLDER

**William R. Riche, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.**

**Filed Oct. 24, 1980, Ser. No. 200,137**

**Int. Cl.³ B23Q *3/08***

**U.S. Cl. 269—29** **15 Claims**



1. Positioning apparatus for maintaining the locating surface of a workpiece in contact with a fixed abutment of a workholder designed to receive workpieces subject to substantial manufacturing tolerances in which forces are imparted to each workpiece during machining operations which tend to move the locating surface of the workpiece away from the fixed abutment of the workholder, comprising:

(a) a support body having a first fluid cavity;

(b) first piston mounted for movement within said first fluid cavity;

(c) an adjustable stop means connected with said first piston for movement toward and away from the fixed abutment of the workholder between a retracted position in which workpieces may be removed from and inserted into the workholder and an advanced position in which the locating surface of the inserted workpiece is maintained in contact with the fixed abutment of the workholder;

(d) operator means for moving said adjustable stop means from said retracted position to said advanced position by a distance which depends on the size of the inserted workpiece and for holding the locating surface of each inserted workpiece against the fixed abutment of the workholder during machining operations on an inserted workpiece by preventing movement of said adjustable stop means during all such machining operations, said operator means including:

(1) an operator body containing a second fluid cavity,

(2) a second piston mounted for movement within said second fluid cavity between a retracted position and an adjustable advanced position,

(3) control means for moving said second piston between said positions to control initially the amount of force applied to the workpiece by the adjustable stop means and for fixing said second piston in said advanced position during all machining operations on an inserted workpiece, and

(4) hydraulic link means for causing said first piston to move in response to movement of said second piston, said hydraulic link means including a fluid flow path between said first and second fluid cavities and an incompressible fluid filling said fluid flow path, whereby movement of said second piston to its advanced position and fixation of said second piston in said advanced position by said control means will cause said first piston to advance and become fixed in its position as long as said control means maintains said second piston in its advanced position and further wherein said support body and said operator body are integrally connected to form an L-shaped member, said first and second fluid cavities having parallel longitudinal axes oriented, respectively, to intersect the lateral side of one leg portion of said L-shaped member and the end surface of the other leg of said L-shaped member.

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**4,381,859**

## WEB LAYING METHOD AND APPARATUS

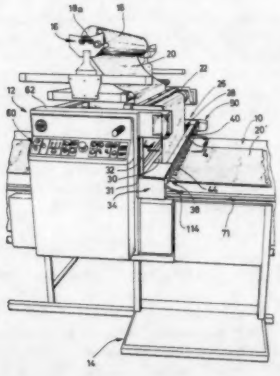
**Rolf Jung, Waiblingen, and Walter Wienen, Fellbach, both of Fed. Rep. of Germany, assignors to Krauss u. Reichert GmbH & Co. KG, Fellbach, Fed. Rep. of Germany**

**Filed Sep. 26, 1980, Ser. No. 191,822**

**Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009748**

**Int. Cl.³ B65H *29/46***

**U.S. Cl. 270—31** **16 Claims**



1. In a method of laying a web in superposed layers by a web laying machine on a laying table; the method including the steps of moving a laying carriage back and forth along the length of the laying table between first and second end positions; pulling a web from a web supply and laying a web length on the laying table at least during the travel of said laying carriage from said first end position to said second end position by a web laying unit mounted on the laying carriage; immobilizing the web by a web holding unit arranged at the first end

position while the laying carriage moves from the first end position to the second end position; the improvement comprising the steps of maintaining said web laying unit, during a substantial part of the travel of the laying carriage between the two end positions, at a first laying height above the laying table; and, as said laying carriage approaches said first end position, lowering said web laying unit to a second laying height when said carriage reaches a predetermined location in a zone of said first end position, whereby said laying unit is in said second laying height when said carriage is in said first end position; said second laying height being lower than said first laying height and being at least approximately at a level of the precedingly deposited web layer or, in the absence thereof, at a level of said laying table.

6. In a web laying machine including a laying table; a laying carriage arranged for back-and-forth travel along the laying table; drive means for propelling the laying carriage; limit switch means operatively connected to said drive means for determining first and second end positions of said laying carriage; means for supporting a web supply; web pulling means mounted on said carriage for drawing web lengths from the web supply; a web laying unit mounted on said laying carriage for laying web, pulled from the web supply, on the laying table at least during the travel of said laying carriage from said first end position to said second end position; means supporting said web laying unit for reciprocating motion towards and away from the laying table perpendicularly thereto; a winch means mounted on said laying carriage and operatively connected to said web laying unit for raising and lowering said web laying unit with respect to said laying table; and a web holding unit arranged at least in said first end position for grasping and immobilizing the web while said web laying unit deposits a web length on said laying table; the improvement comprising height control means mounted on said laying carriage and being operatively connected to said limit switch means and said winch means for raising and lowering said web laying unit as a function of the momentary location of said laying carriage with respect to said end positions; said height control means including height sensing means for responding to a first height position of said web laying unit above a web layer deposited last or, in the absence thereof, above said laying table; said height control means further including height switching means for setting a second height position of said web laying unit above the deposited web layer or, in the absence thereof, above said laying table; said first and second height positions being at different height levels, in a height position which is at a lower height level of said different height levels, said web laying unit being situated at least approximately at the level of a web layer precedingly deposited on said laying table or, in the absence of a precedingly deposited layer, at least approximately at the level of said laying table; said limit switch means including a first control element means for actuating said limit switch means shortly before said laying carriage reaches said first end position and a second control element means for actuating said limit switch means when said laying carriage reaches said first end position; said first control element means being operatively connected to said height control means for lowering said web laying unit shortly before said laying carriage reaches said first end position.

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**4,381,860**

## PADDLE WHEEL RETARD FEEDER

**Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

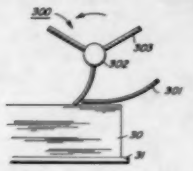
**Filed Nov. 3, 1980, Ser. No. 203,004**
**Int. Cl.³ B65H 3/06**
**U.S. Cl. 271—10** **2 Claims**

1. A substrate sheet feeding apparatus, comprising:

at least one high friction tipped member movable in a path so as to intersect with the plane of a substrate to be fed and apply a normal force thereto;

means for moving said high friction tipped member through said path; and

intercept means for relieving said normal force after the initial contact of said friction tipped member with said substrate by lifting said friction tipped member out of




contact with said substrate sheet before said normal force reaches a maximum value.

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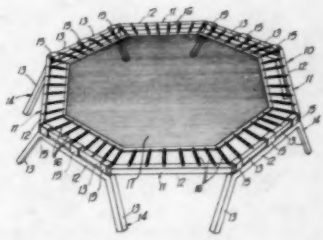
**4,381,861**

## OCTAGONAL TRAMPOLINE

**William T. Howell, Jr.; Danny T. Howell, and John T. Howell, all of Rte. 6, Box 39, Eastman, Ga. 31023**

**Filed Dec. 17, 1981, Ser. No. 331,522**
**Int. Cl.³ A63B 5/18**
**U.S. Cl. 272—65** **11 Claims**



1. A trampoline comprising a perimeter frame consisting of plural identically-shaped and sized frame sections adapted in assembled relationship to form a continuous perimeter frame disposed in one plane, plural support legs for the perimeter frame corresponding in number to said frame sections of the perimeter frame and being shaped and sized identically to said frame sections, and releasable connector means on each support leg engageable with corresponding end portions of adjacent pairs of said perimeter frame sections to join such sections in said one plane and to secure each support leg to one perimeter frame section dependingly in a plane substantially perpendicular to said one plane, and said connector means comprising plural spaced coaxial sleeves fixed to the top of each support leg and receiving telescopically therein the corresponding end portions with the latter in coaxial relationship, said sleeves and end portions having engaging flat faces resisting relative rotation of the sleeves and end portions.

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**4,381,862**

## FEED CHANNELS FOR POOL TABLES

**Norman L. Rimmer, The Old Golf House, Whaley Bridge, Stockport, England**

**Filed Jan. 22, 1981, Ser. No. 227,277**
**Claims priority, application United Kingdom, Jan. 26, 1980, 8002716**
**Int. Cl.³ A63D 15/00**
**U.S. Cl. 273—11 C** **6 Claims**

1. A games table for playing games such as pool with object balls and a smaller diameter cue ball, said table being of the kind having a floor-standing housing supporting a top playing surface, pockets at the periphery of said surface, a ball outlet at a side of the housing, a racking arrangement for storing balls

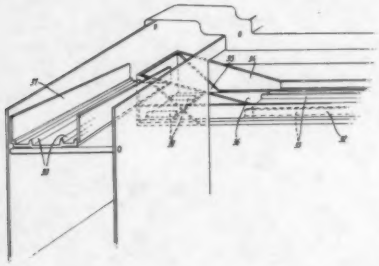
within the housing, and channels within the housing interconnecting said pockets, said outlet and said racking arrangement, said channels and racking arrangement having rails along with the ball are adapted to run, and wherein said racking arrangement comprises:

an elongate rack pivotable between a storage position at which balls are stored on said rack and a delivery position at which said balls are discharged from said rack for delivery to the player;

said rack having said rails therealong arranged to align said balls along a single axis in said storage position of said rack;

an elongate feed structure for feeding balls to the rack, said feed structure having said rails therealong for guiding said balls;

an aperture between said feed structure and said rack



through which said smaller diameter cue ball can drop but not the larger diameter said object balls;

a first downwardly inclined ramp defined by spaced-apart rails connecting said feed structure with said rack and along which said larger diameter object balls can run over said aperture to said rack; and

a second downwardly inclined ramp defined by spaced-apart rails connecting said feed structure with said aperture and along which said smaller diameter cue ball can run to said aperture, said rails of said second ramp being below and between and of steeper inclination than said rails of said first ramp;

whereby when all object balls have been fed to said rack, the last said object ball is supported on said first ramp and is then operable to hold said cue ball on said second ramp and thereby block same from dropping through said aperture.

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**4,381,863**

## FINGER HOLE INSERT FOR BOWLING BALLS

**Bill Norman, Tustin, Calif., assignor to Master Industries, Inc., Irvine, Calif.**

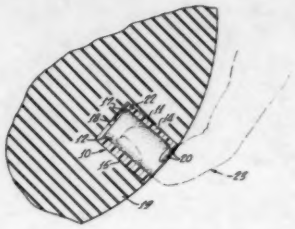
**Filed Jul. 13, 1981, Ser. No. 282,418**
**Int. Cl.³ A63B 37/00**
**U.S. Cl. 273—63 A** **8 Claims**

1. A finger hole insert for bowling balls, which comprises:

(a) a hollow cylindrical body of deformable rubber-like material having an open outer end and a wall at the inner end thereof,

said wall having an opening therein sufficiently large to permit inspection of the region of the ball beneath the insert, but sufficiently small to prevent passage therethrough of a finger of the bowler, and

(b) an integral inwardly protuberant ridge provided at the rim of the outer end of said insert and adapted to have a finger of the bowler hooked therearound when the ball is gripped, said ridge extending around approximately half the circumference of the body, and being generally cres-



cent shaped so that the ends thereof merge toward the interior surface of said body.

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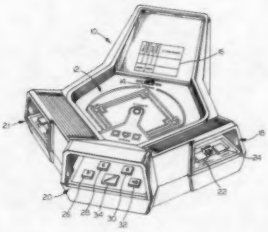
**4,381,864**

## ELECTRONIC BASEBALL GAME METHOD AND APPARATUS

**Eric Bromley, West Simsbury, and Thomas Helmer, Lebanon, both of Conn., assignors to Coleco Industries, Inc., Hartford, Conn.**

**Filed May 16, 1980, Ser. No. 150,440**
**Int. Cl.³ A63F 9/00**
**U.S. Cl. 273—88** **16 Claims**



1. In an apparatus for simulating a baseball game, the combination comprising:

a. a display panel including a visual simulation of a baseball field and adapted, upon application of electrical signals thereto, to display symbols including a ball symbol for simulating a ball and to indicate outcomes of simulated batter swings at the simulated ball, the possible outcomes including base hits and multiple base hits, the possible outcomes thereby including outcomes representing batted balls;

b. a control board including a multiplicity of manually operable control elements and operable by operation of at least one of said manually operable control elements to generate signals signifying simulated batter swings at said simulated ball, at least one of said control elements being manually operable to provide variation between generated signals indicative of a choice of the type of batter swing being simulated, said choice being between at least a normal type of batter swing and a power type of battery swing; and

c. operational circuit means operatively connected to said display panel for generation and transmission of electrical signals to said display panel to display said ball symbol and indicate the outcome of simulated batter swings at the simulated ball, said operational circuit means being electrically connected to said control board for reception therefrom of the electrical signals signifying simulated batter swings at the simulated ball and indicating which type of

batter swing is being simulated, said operational circuit means including:

(i) means for generating a signal to produce a ball symbol on the display panel and for moving the ball symbol along said simulated playing field to simulate a pitch;

(ii) means for detecting the time during the simulated movement of the pitched ball at which the swing-signifying signal is received;

(iii) means for establishing probabilities for the possible outcomes of the simulated batter swing, the probabilities being dependent on at least two modifying factors, one modifying factor upon which said probabilities are dependent being the probability data associated with the batter then at the plate and indicative of his predetermined batting average, another being the type of batter swing being simulated, the probability, if all other modifying factors are the same, that a simulated hit will result from the normal type of simulated batter swing always being greater than the probability that a simulated hit will result from the power type of simulated batter swing, the ratio, if all other modifying factors are the same, of the probability of a simulated multiple base hit to that of a simulated base hit being greater for the power type of simulated batter swing than for the normal type;

(iv) means for determining the outcome to be displayed on said display panel in response to signals from said operational circuit means, said determination being in a manner dependent on said probability data associated with the batter then at the plate, the type of swing selected, and the detected time during the simulated movement of the pitched ball when the simulated batter swing occurs, the outcome within at least a range of swing times being determined for at least some simulated batter swings in a variable manner in accordance with the probabilities established by said means for establishing probabilities; and

(v) means for generating a signal to produce a batter symbol on said display panel at the simulated home plate position of said simulated playing field and thereafter responsive to said outcome determining means to produce a runner symbol at a selected one of the bases on the simulated playing field if a hit or a walk is determined or the batter symbol at the home plate if a strike or a ball is determined.

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**4,381,865**

## GEOMETRIC DOMINO-TYPE GAME

**Mercedes Z. de Cubas, and Luis A. de Cubas, both of 5025 Sheridan Ave., South, Minneapolis, Minn. 55410**

**Filed Jul. 13, 1981, Ser. No. 282,860**
**Int. Cl.³ A63F 9/20**
**U.S. Cl. 273—294** **12 Claims**

1. Apparatus for playing a domino-type game comprising a plurality of domino-like game pieces:

(A) each of said game pieces being flat and of substantially equal length and thickness,

(B) each of said game pieces having parallel substantially equally spaced apart sides,

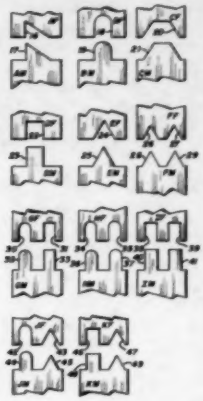
(C) each of said game pieces having one of a plurality of different interfitting geometric configurations at at least one end matable with a complementary geometric configuration in another of said game pieces to connect adjacent pieces,

(D) each of said game pieces being structurally distinctive and different from each other game piece,

(E) certain of said geometric configurations comprising a single geometric element and other of said geometric configurations having a plurality of geometric elements,

(F) complementary male and female geometric configurations on said game pieces being equal in number,

(G) certain of said game pieces being doubles in the sense of having the same male or female geometric configuration at each end, and



(H) two of the game pieces having only a single geometric configuration at one end, the other end of the game piece being flat.

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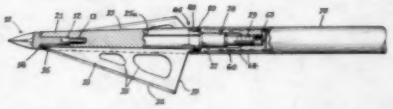
**4,381,866**

## ARROWHEAD WITH REMOVABLE BLADES

**Miroslav A. Simo, 370 N. Delapisine Rd., Riverside, Ill. 60546**

**Filed Apr. 1, 1982, Ser. No. 364,499**
**Int. Cl.³ F41B 5/02**
**U.S. Cl. 273—422** **28 Claims**



1. An arrowhead assembly with removable blades for attachment to the forward end of an arrow shaft comprising:

a body of generally circular cross section having a forward end and a rearward end, a generally pointed nose extending from said forward end and said rearward end having fastening means for securement to said forward end of an arrow shaft, said body having a shoulder portion at the forward end of said fastening means, said body having multiple radial slots along its long axis for receiving said removable blades, said slots terminating in an acute angle stop at their forward end in the region of said nose and extending into said shoulder portion at their rearward end;

a non-deformable blade locking ring fitting over said shoulder portion of said body, said locking ring having an undercut forward portion spacing the forward portion of said ring outwardly from said shoulder, the rearward end of said undercut forming an acute angle to the axis of said ring;

a compressible ring fitting over said shoulder of said body adjacent the rearward side of said locking ring and adjacent the forward end of said arrow shaft, said compressible ring being in compressed condition when said arrowhead assembly is installed on said arrow shaft; and

multiple blades having a shape exterior to said arrowhead body adapted for good aerodynamic flight characteristics and deep target penetration, said blades having an acute angle at their forward ends to mate against said acute angle stop and having an extension at their rearward ends

to mate within said non-deformable locking ring undercut portion and an acute angled end to mate against said angle at the rearward end of said undercut.

22. In a self-aligning and self-centering arrowhead assembly having removable blades fitting in radial slots along the long axis of a blade carrying body and attached to an arrow shaft insert having a chamfer within a receiving cylinder, a self-aligning, self-centering means comprising:

a non-deformable blade locking ring fitting over a portion of said blade carrying body, said locking ring having an undercut forward portion fitting loosely over a rearward extension of each of said blades, the rearward end of said undercut having an acute angle for forcible engagement against an angle at the rear end of said blade rearward extension;

a compressible, resilient ring fitting over said blade carrying body adjacent the rearward side of said non-deformable blade locking ring;

a mating bevel on said blade carrying body positioned to engage said arrow shaft insert receiving cylinder chamfer and compressing said compressible ring upon such engagement whereby uneven forces by compressible ring are accommodated by canting of said non-deformable blade locking ring thereby providing solid engagement of said mating bevel and said chamfer.

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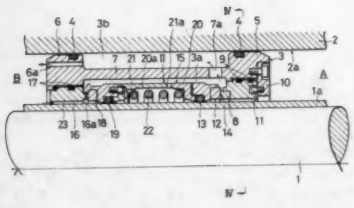
**4,381,867**

## AUTOMATICALLY POSITIONABLE MECHANICAL SHAFT SEAL

**Yoshiaki Ohgoshi, Minoh, Japan, assignor to Nippon Pillar Packing Co., Ltd., Osaka, Japan**

**Filed Mar. 11, 1982, Ser. No. 357,211**
**Claims priority, application Japan, Jan. 7, 1982, 57-2022**
**Int. Cl.³ F16J *15/38, 15/48***
**U.S. Cl. 277—3** **11 Claims**



1. A mechanical shaft seal for intercepting a first fluid and a second fluid, comprising:

a rotary ring disposed on a rotary shaft in a non-rotatable but axially slidable manner;

a stationary ring;

a seal unit case for housing said rotary ring and to which said stationary ring is secured;

a seal housing, said seal unit case being fitted in airtight fashion to and held by the inner periphery of said seal housing in a non-rotatable manner but being automatically axially displaceable to a position on the shaft at which said first and second fluids are balanced in pressure; and,

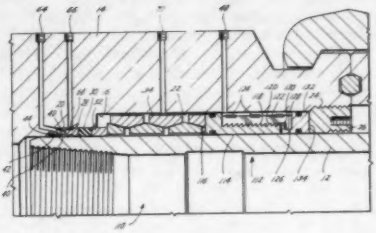
a spring-load retaining mechanism disposed between said seal unit case and said rotary ring for applying spring-load to said rotary ring to maintain contact between said rotary ring and said stationary ring, regardless of the axial displacement of said unit case and the rotation of said rotary ring.

**4,381,868**

## PRESSURE-ACTUATED WELLHEAD SEALING ASSEMBLY

**David G. Croy; Lee M. Hollingsworth; Leonard E. Williams, Jr.; Richard D. Jolly, and Mark C. Tate, all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.**

**Filed Jul. 24, 1981, Ser. No. 286,379**
**Int. Cl.³ E21B *33/12*; F16J *15/48***
**U.S. Cl. 277—27** **13 Claims**



1. A seal assembly for sealing across an annular recess between the interior of a wellhead member and the exterior of a tubular member comprising

a heat resistant seal ring positioned in said recess,

a pressure responsive ring positioned in said recess,

means for conducting a fluid under pressure to said pressure responsive ring,

said pressure responsive ring, when actuated by fluid pressure supplied through said conducting means, moving said seal ring to set position,

means for latching said pressure responsive ring in set position, and

spring means between said pressure responsive ring and said seal ring to maintain a sealing force on said seal ring after actuation and latching of said pressure responsive ring.

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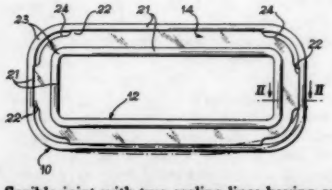
**4,381,869**

## FLEXIBLE JOINT WITH TWO SEALING LINES

**Claude Abbes, Saint Etienne; Fernando Martinez, Mulhouse, and Christian Rouaud, Bourg Saint Andeol, all of France, assignors to Societe Cefilac, Joints Fargere, St. Etienne Cedex, France**

**Filed Jan. 22, 1981, Ser. No. 227,212**
**Claims priority, application France, Feb. 21, 1980, 80 03813**
**Int. Cl.³ F16J *15/00, 9/06*; F02F *5/00***
**U.S. Cl. 277—236** **3 Claims**



1. A flexible joint with two sealing lines having curvilinear portions, comprising all metallic components including two closed elementary joints of different lengths, axes for said elementary joints in the same plane, a shaping template joining said elementary joints supporting at least an outer one of said elementary joints by axially related pairs of flanges on an outer periphery of said template, recesses in said template between consecutive pairs of said flanges, said recesses extending at least in curvilinear portions of said flexible joint, said flanges of

each of said pairs of flanges defining between them a groove receiving said outer one of said elementary joints, each of said elementary joints comprising an inner spring with contiguous turns closed on itself and at least one metal casing receiving said spring, said shaping template having a thickness which is less than an outer diameter of said elementary joints.

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**4,381,870**

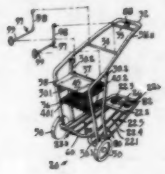
## VERSATILE CART APPARATUS

**James M. Muellner, White Bear Lake, Minn., assignor to Smarte Carte, Inc., White Bear Lake, Minn.**

**Continuation-in-part of Ser. No. 36,211, May 4, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 239,971**

**Int. Cl.³ B62B 3/12**

**U.S. Cl. 280—33.99 B** **42 Claims**



1. An improved multipurpose luggage cart, comprising:

(a) a lower frame defining a broad upper support surface suitable for supportably carrying a plurality of luggage items, said lower frame being generally symmetrically disposed about a longitudinal axis and extending between longitudinally spaced forward and trailing ends;

(b) wheel support means for movably supporting said lower frame on a floor surface, comprising:

(i) a pair of spaced primary support wheels coaxially mounted to said lower frame adjacent said forward end and at oppositely disposed sides thereof; and

(ii) a caster, rotatable about a vertical axis, mounted to said lower frame along its longitudinal axis and adjacent said trailing end thereof;

(c) a pair of upright support members mounted to said lower frame adjacent its forward end and at opposite sides thereof, and rising generally vertically upward therefrom;

(d) an upper frame operatively connecting said pair of upright support members and defining a broad upper support surface suitable for supportably carrying bulky luggage items, said upper frame being generally symmetrically disposed about a longitudinal axis and extending rearward from said upright support members, and overlying in generally parallel spaced relationship, said lower frame;

(e) a first substantially planar member extending generally horizontally between said upright support members; and

(f) a second substantially planar member pivotally mounted between said upright support members for rotation about an axis spaced above and extending generally parallel to, said first planar member, and configured for selective disposition in a first position generally parallel to, and overlying, said first planar member, a second position generally perpendicular to said first planar member, and a third position generally parallel to, and extending rearwardly from, said first planar member.

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**4,381,871**

## SWIVEL COUPLING ELEMENT

**Emil E. Dopyera, 7826 Zilonis Ct., Houston, Tex. 77041, and Jack E. Miller, 9202 Long Barrel, Houston, Tex. 77040**

**Filed Oct. 14, 1980, Ser. No. 196,527**

**Int. Cl.³ F16L 27/06**

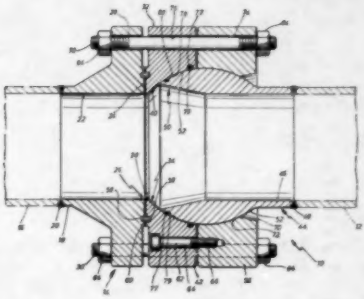
**U.S. Cl. 285—261** **29 Claims**

1. A swivel coupling element adapted to be coupled to a conventional or standard annular coupling flange which has a generally planar leading end defined by a leading end of an annular flange portion and by a seating face proximate the leading end, the annular flange portion having a plurality of circumferentially spaced stud holes for use in coupling the conventional annular coupling flange to another annular coupling flange, the swivel coupling element comprising:

(a) an annular mounting flange having a trailing end, having a leading end which defines a seating face for cooperating with the seating face of such a conventional annular coupling flange, and having a bore which diverges outwardly towards its trailing end to define a concave surface;

(b) a tubular member having a trailing end for connection to a tubular element, and having a leading end with a convex outer surface to cooperate with the concave surface; and

(c) an annular retainer flange which has a bore through which the trailing end of the tubular member extends, the bore having a minimum diameter which is smaller than the maximum diameter of the leading end of the tubular member, the annular retainer flange being connected to the mounting flange by means of connection means to capture the leading end of the tubular member between the annular retainer flange and the annular mounting flange while permitting pivotal displacement of the tubular member relatively to the annular mounting flange, the annular retainer flange having a plurality of circumferentially spaced stud holes which correspond with the stud holes of such a conventional annular coupling flange for receiving bolts or studs for bolting the retainer flange onto such a conventional annular coupling flange to thereby associate the seating face of the annular mounting flange with a seating face of such a conventional annular coupling flange, and to thereby draw the annular retainer and mounting flanges towards each other into locking engagement with the leading end of the tubular member for fixing the tubular member relatively to the annular mounting flange.



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**4,381,872**

## REMOTE CONTROLLED CLAMSHELL BUCKET APPARATUS AND METHOD OF USING SAME

**Oscar W. Hahn, Houston, Tex., assignor to McGinnes Manufacturing Company, Houston, Tex.**

**Filed Mar. 26, 1981, Ser. No. 248,004**

**Int. Cl.³ B66C 3/16**

**U.S. Cl. 294—70** **17 Claims**

1. A clamshell bucket apparatus adapted for transporting bulk material from a first location to a second desired location using a single hoist support line including:

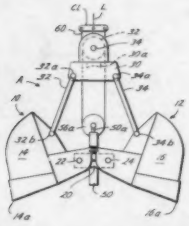
a pair of movably connected clamshell bucket assemblies, each of said assemblies having a scoop section forming a closing edge, said assemblies being relatively movable to each other between an open position placing said closing edges a preselected distance apart and a closed position with said closing edges located in juxtaposed relationship

for forming a receiver with said scoop sections for the bulk material being transported;

means operably connected with said pair of clamshell bucket assemblies for operating and manipulating said clamshell bucket assemblies to transport the bulk material to the desired location, said means for operating and manipulating comprising:

a single hoist support line system adapted to extend from the clamshell bucket apparatus to a crane or the like for selectively supporting the apparatus;

a hydraulic operating system with said clamshell bucket assemblies and connected with said single hoist support line system for releasably holding said clamshell bucket assemblies in the closed position to transport the bulk material, said hydraulic operating system having a normally closed controlled discharge valve for enabling a



desired flow of hydraulic fluid to release said clamshell bucket assemblies for movement from the closed position to the open position for discharging the transported bulk material at the second location;

said normally closed controlled discharge valve being operable to block the flow of hydraulic fluid and to lock said hydraulic operating system relative to said single hoist support line system whereby when the single hoist line is tensioned said clamshell bucket assemblies automatically move to the closed position for forming the receiver for the bulk material; and

radiant energy signal receiver means associated with said normally closed controlled discharge valve for controlled actuation of said discharge valve to release said clamshell bucket assemblies when the presence of a preselected radiant energy signal is sensed by said radiant energy signal receiver means.

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**4,381,873**

## IN SITU ROASTING AND LEACHING OF SULFIDE MINERALS

**Clyde V. Johnson, Lakewood, Colo., and Wilhelmus G. J. Huijnen, Gouda, Netherlands, assignors to Occidental Research Corp., Wheat Ridge, Colo.**

**Filed Aug. 12, 1980, Ser. No. 177,397**
**Int. Cl.³ E21B *43/28;* E21C *41/14***
**U.S. Cl. 299—5** **15 Claims**

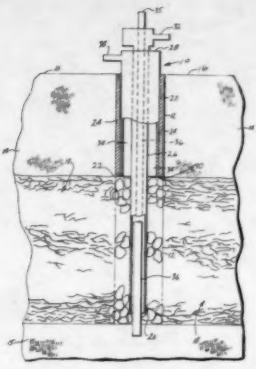
1. A process for increasing the permeability of an ore body containing iron-copper sulfide minerals comprising the steps of:

fracturing an ore body containing iron-copper sulfide minerals for forming ore surfaces within the ore body and for increasing the permeability of the ore body sufficiently to allow passage of gases therethrough;

roasting the fractured ore body in situ for forming a combustion gas comprising sulfur dioxide, the roasting being continued for a sufficient time for forming an iron-rich oxide crust on such ore surfaces and for concentrating copper values remote from such ore surfaces;

removing such a combustion gas from the ore body;

shocking the roasted ore body for releasing such an iron-rich oxide crust from the ore surfaces for exposing the concentrated copper values; and



contacting the copper values with a leach solution comprising mineral acid for leaching said copper values from the ore body.

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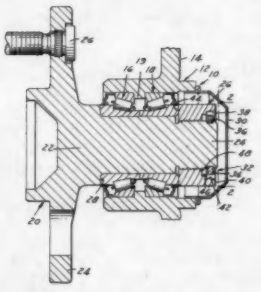
**4,381,874**

## WHEEL SPINDLE RETENTION FOR A NON-DRIVEN VEHICLE WHEEL

**Don S. Strader, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.**

**Filed Nov. 10, 1980, Ser. No. 205,874**
**Int. Cl.³ B60B *35/04***
**U.S. Cl. 301—125** **3 Claims**



1. A wheel mounting arrangement for a vehicle wheel comprising bearing hub means for attachment to vehicle wheel suspension means, bearing means carried by said bearing hub means, spindle means adapted for mounting of a vehicle wheel thereto and including a shaft rotatably carried by said bearing means having a threaded end portion projecting from within said bearing means, a nut threaded onto said shaft end portion and having an axial outboard face for engaging said bearing means to clamp said shaft with respect to said bearing means, and a split lock ring adapted for circumferential expansion for assembly onto said shaft with said nut engaging said bearing means and at a predetermined position normally axially spaced from said nut at a nominal axial distance from abutment with said nut, said nut having an axial inboard face with an internal shoulder having a depth in a direction parallel to the axis of said shaft greater than said nominal axial distance, said internal shoulder including a first portion adjacent said inboard face having a diameter sufficient to permit assembly of said split

ring onto said shaft and a second portion of lesser diameter coaxially outboard of said first portion, said lock ring permitting limited loosening of said nut with respect to said bearing means and said bearing hub means, said second portion of said internal shoulder overlapping and capturing said lock ring upon said limited loosening of said nut and preventing removal of said nut from said shaft, such that operation of the vehicle following said limited loosening of said nut results in rattling at the associated bearing means and wheel.

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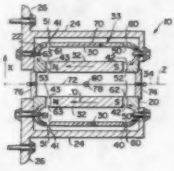
**4,381,875**

## MAGNETIC BEARING AND MOTOR

**Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Mar. 31, 1982, Ser. No. 364,093**
**Int. Cl.³ F16C *39/00***
**U.S. Cl. 308—10** **20 Claims**



1. A magnetic bearing, comprising:

means (**33**) having a plurality of segments (**30, 32/32'/107**) aligned along a longitudinal axis (Z) for providing oppositely directed magnetic flux paths;

said plurality of segments including magnet means (**32/107**) symmetrically positioned around said longitudinal axis for producing magnetic fields within said flux paths, and having arrays of pole faces (**40–43**) concentric about said longitudinal axis;

a plurality of means (**20, 22**) having arrays of end surfaces (**50–53**) concentrically arrayed about a common axis (**34**), separated from said end pieces by air gaps (**60–63**) for controlling flux distribution between said pole faces;

first bracket means (**24, 26**) connectible to a first machine member for holding said plurality of controlling means (**20, 22**) in fixed, axially aligned separation; and

second bracket means (**90, 92**) for connecting said magnetic flux path providing means (**33**) to a second machine member rotatably associated with said first machine member.

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**4,381,876**

## FRONT LIGHTED DISPLAY CASE

**Jay G. Fenwick, Albert Lea, Minn., assignor to Litton Business Systems Inc., Albert Lea, Minn.**

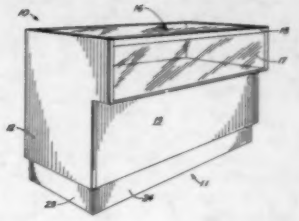
**Filed Nov. 17, 1980, Ser. No. 207,531**
**Int. Cl.³ A47B *47/00*; F16B *12/00***
**U.S. Cl. 312—114** **3 Claims**

1. In a lighted showcase for displaying goods for sale such as jewelry and the like, said case including a base portion, side panels, a generally vertical back portion, a generally vertical front portion at least a portion of which is glass, and a glass top portion, the improvement comprising:

(a) a plurality of cam lock fasteners mounted in each of said base portion, side panels, and front portion, each of said cam lock fasteners being engageable upon arranging said base portion, side panels, and front portion in assembled configuration to form a rigid assembly;

(b) a front rail member mounted between said side panels at the upper front corner of said showcase, said front rail including a mounting slot and a locking slot lengthwise of the front face thereof;

(c) a front trim member engageable with said mounting slot and said locking slot of said front rail member whereby said front trim member may be removably mounted to said front rail member;



said glass top portion and said glass front portion being releasably held in place by said front trim member wherein either glass may be easily replaced in situ by removal of said front trim member.

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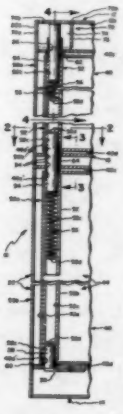
**4,381,877**

## HINGE MECHANISM FOR DOOR OF A COIN OPERATED LOCKER CABINET

**Forest G. Stark, Jamestown, N.Y., assignor to American Locker Security Systems, Inc., Jamestown, N.Y.**

**Filed Nov. 6, 1980, Ser. No. 204,594**
**Int. Cl.³ E05D *7/12***
**U.S. Cl. 312—138 R** **10 Claims**



1. A cabinet comprising in combination:

at least one storage compartment having an access opening vertically bounded by a pair of horizontally extending cabinet frame members, one of said frame members having the interior thereof accessible only from within said storage compartment;

a door for closing said access opening;

hinge means for mounting said door on said frame members for movement between access opening closed and open positions, said hinge means including upper and lower hinge means each comprising an aperture formed in one of said door and said frame members and a hinge pin carried by the other thereof and removably received within its associated aperture, characterized in that said one frame member is formed with one of said apertures and its associated hinge pin is received therewithin to removably position an inserted end thereof within said interior of said

one frame member, is supported for axial sliding movements by said door and has associated therewith spring means for normally maintaining said inserted end within said interior of said one frame member; and

means removably inserted within said interior of said one frame member from within said storage compartment only when said door is in open position for normally preventing unauthorized removal of said associated hinge pin from within said one of said apertures against the bias of said spring means.

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**4,381,878**

**CONTACT SPRING FOR LOW RESISTANCE CONNECTION OF A CIRCUIT BOARD TO A GROUNDED SUBASSEMBLY CARRIER**

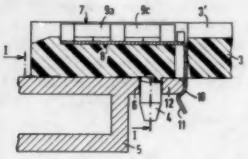
**Ernst-Friedrich Lechner, and Otto Meusel, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Sep. 5, 1980, Ser. No. 184,471**

**Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938760**

**Int. Cl.³ H01R *4/64, 9/09***

**U.S. Cl. 339—14 R** **3 Claims**



1. A connector for removably mounting a circuit board on a subassembly carrier, the circuit board carrying electronic components and comprising at least one conductor run, the subassembly carrier comprising a conducting surface at ground potential, the connector providing a low resistance connection between the conductor run and the conducting surface of the carrier, the connector comprising:

a guide member comprising a channel for receiving the circuit board, a recess in the channel, a base wider than the channel, and an opening extending from the channel to the base, the opening wider than the channel;

a U-shaped contact conformably fitted in the recess, the contact comprising resilient side portions adapted to positively engage the circuit board on both sides and to make a highly conductive electrical connection to the conductor run; and

a spring leg on the contact, the spring leg adapted for passage through the opening in the guide member, the spring leg wider than the channel and comprising a surface adapted to conformably engage the conducting surface of the subassembly carrier to make a highly conductive electrical connection thereto.

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**4,381,879**

**DETENTING LIFT COVER**

**Alfred L. Ehrenfels, Cheshire, and Michael R. Marks, Trumbull, both of Conn., assignors to Harvey Hubbell Incorporated, Orange, Conn.**

**Filed Feb. 25, 1981, Ser. No. 237,889**

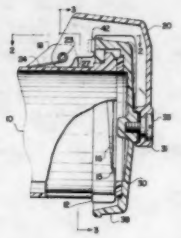
**Int. Cl.³ H01R *13/44***

**U.S. Cl. 339—44 R** **11 Claims**

1. An improved combination housing and cover of the type including a generally cylindrical housing having an open end and an arm hingedly mounted on the outside of the housing and extending to the center of the cover, means for rotatably mounting the cover on the arm, and interengageable means on said housing and said cover for securing said cover to said housing upon rotation of said cover through a predetermined angle from a first position to a second position, wherein the improvement comprises

a wall formed on said arm and extending toward and closely adjacent to said cover;

means on said cover for defining, in sequence, a cam having a sloping cam surface, a recess dimensioned to receive said wall, and a protruding stop shoulder,



said recess being angularly located on said cover to receive said wall and inhibit cover rotation when said cover is in said first position in which said means for securing is disengaged, whereby said cover and arm can be hinged away from said open end with said wall in said recess,

said cover being rotatable to said second position when said cover is closed by rotating said cover so that said cam surface rides over said wall.

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**4,381,880**

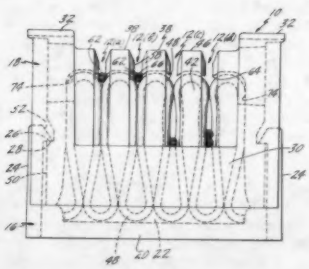
**MULTIPLE ELECTRICAL CONNECTOR AND BLOCK**

**Karl-Heinz Pohl, Woodbury, Conn., assignor to The Siemon Company, Waterton, Conn.**

**Continuation of Ser. No. 184,665, Sep. 8, 1980, abandoned. This application Jun. 9, 1981, Ser. No. 269,551**

**Int. Cl.³ H01R *4/24***

**U.S. Cl. 339—97 P** **34 Claims**



1. A block for housing connector elements formed from electrically conductive stock of circular cross-section, the block including:

a retainer section;

a plurality of substantially parallel spaced slots in said retainer section;

a main body section;

a plurality of substantially parallel spaced slots in said main body section, said body section slots each being in alignment with a corresponding slot in said retainer section;

a plurality of bridge elements on said main body section, said bridge elements each being in alignment with a main body section slot, each bridge element defining a passage in registration with the main body section slot with which it is aligned;

said corresponding retainer section slots, main body section slots and bridge element passages cooperating to define housings for the connector elements;

the bridge elements which are in alignment with each slot being spaced apart and being in alignment with the bridge elements which are in alignment with other body section slots to define spaced columns which guide electrical conductors to connector elements which are to be inserted in said block; and

means for releasably joining said retainer section to said main body section.

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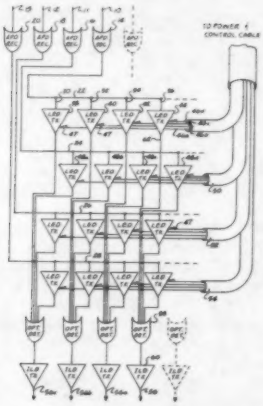
**4,381,881**

## FIBER OPTIC CROSSBAR SWITCH FOR AUTOMATICALLY PATCHING OPTICAL SIGNALS

**Charles H. Bell, Merritt Island, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed May 27, 1980, Ser. No. 153,245**
**Int. Cl.³ G02B 5/14**
**U.S. Cl. 350—96.16** **8 Claims**



8. A system for automatically optically switching fiber optic data signals between a plurality of input optical fibers and selective ones of a plurality of output optical fibers comprising:

(a) an optical detector means connected to each of said input fibers for converting said optic data signal appearing at said respective input fibers to an RF signal;

(b) a plurality of RF to optical signal converters arranged in a group;

(c) the output of each of said optical detector means being connected to the input of each of said RF to optical converters in a respective group of said optical signal converters;

(d) a source of DC power;

(e) means for selectively applying said DC power to selective ones of said RF to optical signal converters causing any RF signal appearing at the input thereof to be converted to an optical signal; and

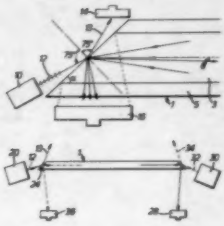
(f) optical fiber means connected to predetermined outputs of said RF to optical signal converters for supplying said optical signals from said RF to optical signal converters to predetermined ones of said output optical fibers.

**4,381,882**

## FIBRE OPTIC TERMINATION

**Percy V. H. Sabine, Box Hill North, Australia, assignor to Australian Telecommunications Commission, Melbourne, Australia**

**Continuation of Ser. No. 78,465, Sep. 24, 1979, abandoned. This application May 22, 1981, Ser. No. 266,321**
**Claims priority, application Australia, Sep. 28, 1978, PD6157**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.20** **16 Claims**



1. Apparatus for transmission of signals comprising

an elongate optical fibre having a core of refractive index n', surrounded by cladding of refractive index $n_c$,

said elongate optical fibre having first and second terminations at first and second ends respectively,

each said termination including a surface through which light is, in use injected into the core of the fibre at an angle $\phi$ relative to a normal to said surface, the surface being arranged such that the longitudinal axis of the core is inclined at an angle $\alpha$ to said surface, and wherein

$$90°-\phi_c'-\theta_c' \leq \alpha \leq 90°-\phi'+\theta_c'$$

where

$\phi_c'$=arc sin (n/n')

$\theta_c'$=arc sin $(2\Delta n_m)^{\frac{1}{2}}$

$\phi'$=arc sin (sin $\phi$)/n'

$\Delta n_m=(n'-n_c)/n'$ and

wherein arc sin $[n' \sin (\phi_c'-2\theta_c')] \leq \phi \leq 90°$,

a first source of light arranged to inject a first beam of light into said surface of said first termination at a first angle $\phi$ relative to the normal to said surface of the first termination,

a first detector located adjacent to said second termination and arranged to receive components of said first beam which are reflected at said surface of said second termination through the core and cladding of the second termination,

a second source of light arranged to inject into said surface of said second termination a second beam of light at a second angle $\phi$ relative to the normal to said surface of the second termination, and

a second detector located adjacent to said first termination and arranged to receive components of said second beam which are reflected at said surface of the first termination through the core and cladding of the first termination.

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**4,381,883**

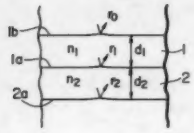
## LIGHT ABSORPTIVE FILM PROVIDED WITH A REFLECTION PREVENTIVE MEANS

**Kimiaki Yamamoto, Hachioji, and Takaharu Koike, Ina, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jul. 1, 1980, Ser. No. 164,936**
**Claims priority, application Japan, Jul. 3, 1979, 54-84160**
**Int. Cl.³ G02B 1/10**
**U.S. Cl. 350—164** **6 Claims**

1. A light absorptive film provided with reflection reduction

means, said film comprising a light absorptive metallic layer and a layer of dielectric material arranged on the incidence side of said light absorptive layer, wherein the refractive index and thickness of said metallic layer and the refractive index and thickness of said dielectric material layer is selected in such a manner that the reflected wave produced on the boundary surface between said metallic layer and said layer of dielectric material is canceled by the reflected wave produced on the other surface of said metallic layer, said film satisfying the following condition,




$$|r_0| + |r_2| \cong |r_1|,$$

wherein $r_0 = |r_0|e^{i\theta 0}$ represents reflectance on the surface of said dielectric material arranged on the incidence side, $r_1 = |r_1|e^{i\theta 1}$ designates reflectance on the boundary surface between said layer of the dielectric material and said metallic layer, and $r_2 = |r_2|e^{i\theta 2}$ denotes reflectance on the emerging side surface of said metallic layer and wherein the conditions mentioned below are satisfied:

$$(\theta_1 - \theta_0 + 0.6\pi)\frac{\lambda}{4\pi} \leqq n_1 d_1 \leqq (\theta_1 - \theta_0 + 1.4\pi)\frac{\lambda}{4\pi}$$

$$(\theta_2 - \theta_1 - 1.3\pi)\frac{\lambda}{4\pi} \leqq n_2 d_2 \leqq (\theta_2 - \theta_1 - 0.7\pi)\frac{\lambda}{4\pi} \text{ or}$$

$$(\theta_1 - \theta_0 - 1.4\pi)\frac{\lambda}{4\pi} \leqq n_1 d_1 \leqq (\theta_1 - \theta_0 - 0.6\pi)\frac{\lambda}{4\pi}$$

$$(\theta_2 - \theta_1 + 0.7\pi)\frac{\lambda}{4\pi} \leqq n_2 d_2 \leqq (\theta_2 - \theta_1 + 1.3\pi)\frac{\lambda}{4\pi} \text{ wherein}$$

$$\theta_1 - \theta_0 < 0 \text{ and } \theta_2 - \theta_1 > 0.$$

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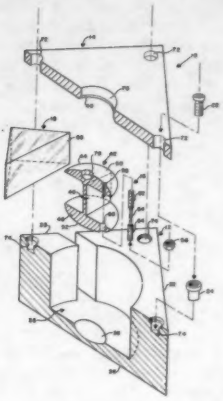
**4,381,884**

## ADJUSTABLE HOLDER FOR AN OPTICAL ELEMENT

**Omer Houle, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed May 28, 1981, Ser. No. 267,938**
**Int. Cl.³ G02B 7/18**
**U.S. Cl. 350—287** **6 Claims**

1. An adjustable holder for an optical element, comprising:
(a) a base having a portion defining a first spherical surface;
(b) a cover mountable to said base and having a portion defining a second spherical surfaces spaced from, but facing, said first spher'.al surface when said cover is mounted to said base;
(c) means for supporting the optical element, said supporting means capable of being disposed between said base and cover and having spherical surface portions at its opposite ends engageable with said first and second spherical surface portions of said base and cover along a common spherical surface for allowing universal movement of said supporting means relative to said base, when said supporting means is disposed between said base and cover; and
(d) means for attaching said cover to said base so as to apply forces through said first and second spherical surface portions of said base and cover and against said opposite end spherical surface portions of said supporting means for clamping the same in a fixed angular position relative to said base, said attaching means being adjustable for varying the magnitude of said forces so applied to allow said supporting means to be universally moved relative to



said base to readjust the angular position of said supporting means and optical element therewith relative to said base in roll, pitch and yaw simultaneously.

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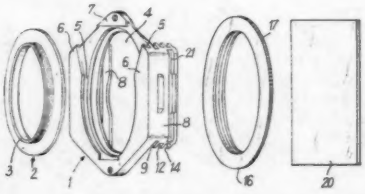
**4,381,885**

## DEVICE FOR HOLDING ACCESSORIES FOR THE LENSES OF APPARATUSES FOR TAKING PICTURES

**Jean-Claude Coquin, 15, rue Jean Bologne, 75016 Paris, France**

**Filed Mar. 9, 1979, Ser. No. 18,883**
**Claims priority, application France, Mar. 14, 1978, 78 07309**
**Int. Cl.³ G02B 7/00**
**U.S. Cl. 350—318** **11 Claims**




1. A device for holding accessories on an apparatus for taking photographs comprising an annular body, an intermediate mounting element for mounting the body on the lens of the apparatus for taking photographs, said mounting element including a removable annular sleeve provided with external threading for screwing it onto the lens, said body having on one side a recess for receiving the edge of said sleeve in such a way as to permit a relative movement of rotation of the said body in relation to the said lens, said body also having at least one pair of grooves, on its side which is opposite the recess for said sleeve, for receiving the edge of a photographic accessory.

**4,381,886**

## LIQUID CRYSTAL DISPLAY ELEMENT

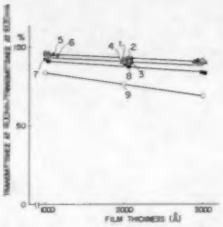
**Hisao Yokokura, Hitachi; Teruo Kitamura, Katsuta; Ren Ito, Hitachi; Fumio Nakano, Hitachi; Hirosada Morishita, Hitachi; Mikio Sato, Hitachi, and Yasuhiko Kando, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 13, 1981, Ser. No. 234,261**

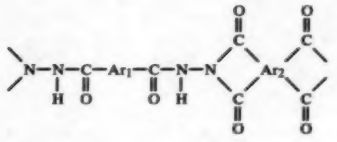
**Claims priority, application Japan, Feb. 15, 1980, 55-16654**

**Int. Cl.³ G02F *1/13***

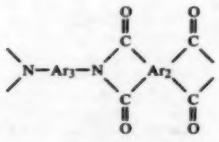
**U.S. Cl. 350—341** **21 Claims**



**1.** In a liquid crystal display element comprising substrates having electrodes and liquid crystal orientation controlling films on the sides thereof facing a liquid crystal layer and one or more liquid crystal layers interposed between said substrates, the improvement wherein the liquid crystal orientation controlling film is made from a copolymer having structural units of the formulae:



and



wherein $Ar_1$ is a dihydrazide residue; $Ar_2$ is a tetracarboxylic acid residue; and $Ar_3$ is a diamine residue.

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**4,381,887**

## SIMPLIFIED ACOUSTO-OPTIC DEFLECTOR USING ELECTRONIC DELAYS

**Jean-Michel Guerin, Los Angeles, and John A. Lucero, Glendora, both of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 22, 1980, Ser. No. 189,273**

**Int. Cl.³ G02F *1/29***

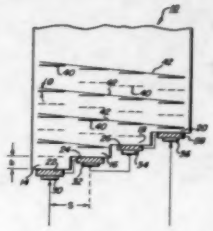
**U.S. Cl. 350—358** **7 Claims**

**1.** An acousto-optic deflector comprising:

means for projecting a beam of substantially monochromatic light along a predetermined path;

a light-sound interaction device comprising an acoustic-wave transmitting medium and transducer means coupled to said medium for propagating therein, across said predetermined path, sound waves in a direction longitudinally related to said path but inclined thereto at an angle selected to provide Bragg diffraction of said light beam, said transducer means comprising a transducer element bonded to one edge of said medium in a substantially planar arrangement;

a plurality of electrodes coupled to said transducer element, the length L of each electrode and gap g therebetween being selected to optimize diffraction efficiency of the light as it interacts with said sound waves as the deflection



angle between said predetermined path of monochromatic light and said sound waves is caused to change; and

means for applying an RF drive signal to said plurality of electrodes, said drive signal being applied directly to one of said plurality of electrodes and coupled to each of the other electrodes via means for electronically delaying said drive signal.

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**4,381,888**

## RETROFOCUS TYPE LARGE APERTURE WIDE ANGLE OBJECTIVE

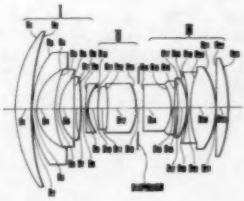
**Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 10, 1981, Ser. No. 272,379**

**Claims priority, application Japan, Jun. 11, 1980, 55-78704**

**Int. Cl.³ G02B *9/64, 13/04***

**U.S. Cl. 350—458** **5 Claims**



**1.** A large relative aperture, wide angle objective lens of the retrofocus type including, successively in the direction from front to rear, first, second and third lens groups, of which the first lens group has a negative refractive power and comprises, from front to rear, a positive meniscus lens convex toward the front, a negative meniscus lens convex toward the front, a negative meniscus lens convex toward the front, a positive lens and a negative meniscus lens convex toward the front, the second lens group has a positive refractive power and comprises a cemented bi-convex lens, and the third lens group has a positive refractive power and comprises, from front to rear, a cemented lens of a positive element and a negative element, a positive meniscus lens convex toward the rear, a cemented lens of a negative element and a positive element, and a positive lens, and a diaphragm positioned in a space between the second and third lens groups.

**4,381,889**

## CAMERA DIAPHRAGM APERTURE CONTROL DEVICE

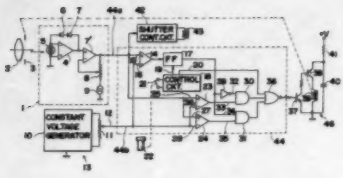
**Masayoshi Sahara, Sennan, and Masaaki Nakai, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Feb. 24, 1982, Ser. No. 351,957**

**Claims priority, application Japan, Mar. 3, 1981, 56-30878**

**Int. Cl.³ G03B** *7/085;* **H01H** *47/24;* **H03K** *5/153*

**U.S. Cl. 354—41** **12 Claims**



8. A control device for a photographic camera comprising:

a movable member movable from an initial end position towards a terminal position;

a signal means for generating a variable signal which varies with the movement of said movable member;

a reference means for generating a reference signal;

comparison means for comparing said variable and reference signals and generating a stop signal when the difference between the signals reaches a selected one of a plurality of given values;

electromechanical means for stopping the movement of said movable member in response to said stop signal;

means for determining, before the actuation of said movable member, the amount of movement of said movable member from said initial end portion to a position where it is to be stopped by said electromagnetic means, and generating a control signal in accordance with the determined amount; and

selection means responsive to the control signal for selecting the one of said given value at which the stop signal is generated.

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**4,381,890**

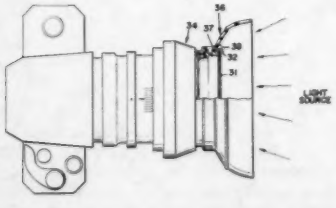
## INCIDENT LIGHT FILTER FOR CAMERAS

**George A. Wallace, 13695 Uvas Rd., Morgan Hill, Calif. 95037**

**Filed May 19, 1980, Ser. No. 151,391**

**Int. Cl.³ G03B** *7/00, 11/00*

**U.S. Cl. 354—59** **20 Claims**



1. In combination with a single-lens reflex camera having a through-the-lens built-in light metering facility including light-sensitive cells and a lens assembly for admitting light to activate said light metering facility and for focusing an image of a photographic subject on film within the camera, a translucent image-blocking device detachably secured in front of said lens assembly whereby approximately 18% of the light from a source thereof impinging on said translucent image-blocking device passes therethrough and through said lens assembly to activate the light sensitive cells in said built-in light metering facility whereby adjustment of the exposure controls of the camera may be set after which said translucent image-blocking device is removed to permit the image of the photographic subject to pass through the lens assembly when the subject is photographed.

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**4,381,891**

## FILM CASSETTE FOR SEVERAL STRIP FILMS

**Franz Hoffacker, Langenfeld; Guido Kovacic, Unkel, and Hermann Lährig, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jul. 6, 1981, Ser. No. 280,691**

**Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026070**

**Int. Cl.³ G03B** *17/26*

**U.S. Cl. 354—276** **7 Claims**

1. A film cassette adapted to receive at least two photosensitive strip films each providing for a multiplicity of exposures and having perforation for film transport means on the camera side,

said cassette consisting of a lightproof flat, flexible case of substantially the same length as said strip film, at least one cassette orifice arranged at an end face of the cassette and defined by said case and normal to the length of said case, with light sealing means in said orifice adapted to permit said strip film to pass from the lightproof case through the orifice to the exposure place in the camera and back into the case

and to receive said strip films so that they are arranged in said cassette with their longitudinal edges one above the other, said cassette being adapted to bring the perforation of the strip film successively into engagement with the transport mechanism of the camera to provide removal of a first strip film out of the cassette step by step for successive image exposure exterior to the cassette to receive the first strip reintroduced into the cassette after the last exposure and said case being so constructed and the strip film so arranged in the cassette that after the exposure of a first strip film the cassette is removable from the camera and rotatable parallel to one of its axis and

the cassette is adapted to provide for the removal of a next strip film from the cassette by engagement with the mechanism of the camera for advancement of the film for exterior exposure and subsequent reintroduction of the next strip film into the cassette.

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**4,381,892**

## WAIST LEVEL VIEWFINDER

**Hiromi Someya, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 10, 1981, Ser. No. 319,957**

**Claims priority, application Japan, Nov. 13, 1980, 55-162245[U];** Feb. 9, 1981, 56-17825

**Int. Cl.³ G03B** *11/04*

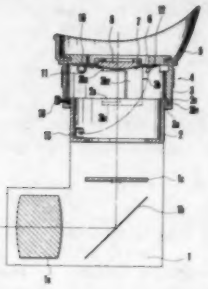
**U.S. Cl. 354—287** **7 Claims**

1. A viewfinder for a camera defining an optical axis and including a focusing plate adapted to permit from above said focusing plate direct observation on said focusing plate of the image of an object to be photographed, comprising:

first light shielding means having a tubular shape installed in said camera;

second light shielding means having a tubular shape slidably fitted in the direction of said optical axis relative to said first

light shielding means while at the same time being freely rotatable around said optical axis, said second light shielding means being changed over by rotation about said optical axis



between a first state where sliding is enabled to a second state where sliding is prevented; and

eyepiece means provided at said second light shielding means.

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**4,381,893**

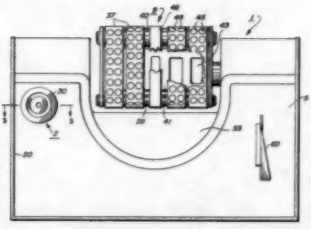
## RECIRCULATING DOCUMENT LATERAL REGISTRATION

**Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 19, 1981, Ser. No. 245,555**

**Int. Cl.³ G03G *15/04;* B65H *9/10***

**U.S. Cl. 355—3 SH** **2 Claims**



1. In a recirculating document handling apparatus for repeatedly recirculating a set of plural flimsy document sheets for precollation copying wherein the document sheets are repeatedly individually fed seriatim from the bottom of a stack thereof for copying in a precise registration position on two axes on a copier platen, in the direction of document movement and laterally thereof, and then returned to the top of the stack and restacked between two elongated lateral edge guides, said two edge guides being laterally spaced by a greater distance than the lateral dimensions of said document sheets to allow unrestricted restacking therbetween with variations in document dimensions, and one of said edge guides being stationarily aligned with said lateral registration position on said platen but spaced therefrom, and the other edge guide being repositionable for different sizes of documents, the improvement in maintaining said lateral registration of each document sheet in the platen registration position comprising:

lateral registration means underlying the stack for individually acquiring each document sheet when it is the bottom sheet of the stack of document sheet and individually urging said bottom sheet laterally gently into contact with said stationary one of said two restacking lateral edge guides with automatic force limiting means to laterally register said bottom sheet,

means for blowing air between said bottom sheet and said stack of sheets to enable the lateral movement of said bottom sheet by said lateral registration means relative to said stack of sheets,

said lateral registration means automatically releasing said bottom sheet after it is so laterally registered, and

non-skewing feeding means for feeding said bottom sheet out from said stack to said platen maintaining alignment with said one lateral edge guide, after the bottom sheet has been laterally registered and relased by said lateral registration means, so as to provide lateral registration of the sheet on the platen for said copying registration without over-platen lateral registration means.

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**4,381,894**

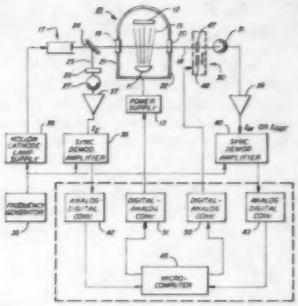
## DEPOSITION MONITOR AND CONTROL SYSTEM

**Carl A. Gogol, Jr., Cazenovia, and Eric T. Prince, Fayetteville, both of N.Y., assignors to Inficon Leybold-Heraeus, Inc., East Syracuse, N.Y.**

**Filed Nov. 6, 1980, Ser. No. 204,644**

**Int. Cl.³ G01N *21/84, 21/31***

**U.S. Cl. 356—72** **8 Claims**



1. The method of correcting flow indication measurements in a vacuum deposition system of the type wherein a single atom evaporant is flowed onto a substrate in a vacuum, the steps including

passing radiation containing a first emission line at a wavelength that is absorbable in the single atom evaporant and a second emission line at a wavelength that is not absorbable in said single evaporant through the flow maintained in the chamber along a common optical path,

measuring the intensity of the radiation at the first and second emission lines after said radiation has passed through the flow, and

correcting the intensity measurement of the first emission line for changes in the intensity of the second emission line to compensate for errors produced by the realignment in the measuring equipment during the measurement period.

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**4,381,895**

## METHOD AND APPARATUS FOR AUTOMATIC FLOW-THROUGH DIGITAL REFRACTOMETER

**Leonard A. Hughes, Oakland; Evan R. Flavell, Albany, both of Calif., and Benjamin C. Willman, Monmouth Beach, N.J., assignors to Biovation, Inc., Richmond, Calif.**

**Filed Feb. 28, 1980, Ser. No. 125,549**

**Int. Cl.³ G01N *21/41***

**U.S. Cl. 356—134** **22 Claims**

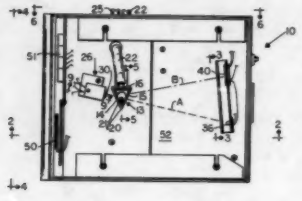
1. A method for determining the concentration of dissolved solids in a liquid sample, comprising the steps of:

directing a collimated beam of monochromatic light through a hollow, empty prismatic container which is enclosed in an opaque housing,

detecting the refraction of said beam on its path of emergence from said prismatic container,

introducing a liquid sample to be tested into said prismatic container thereby changing the degree of refraction of said beam,

disabling measurement of said refraction and further proceeding with the method until after an amount of said



liquid sample sufficient for accurate testing has been placed in the prismatic container,

and only then, as soon as a predetermined amount of said liquid sample sufficient for accurate testing has been placed in the prismatic container, measuring the refraction of the beam through the sample-filled prism, and

displaying of the measured refraction as a function of the concentration of dissolved solids in the sample.

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**4,381,896**

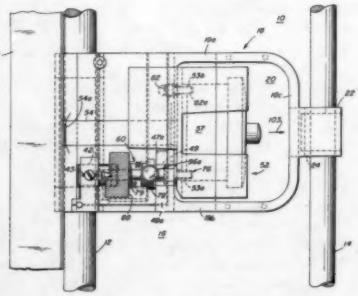
## PRINT HEAD MOUNTING ASSEMBLY WITH FORM ADJUSTMENT

**John Shiurila, Londonderry, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.**

**Filed Oct. 20, 1980, Ser. No. 199,017**

**Int. Cl.³ B41J *11/20***

**U.S. Cl. 400—56** **8 Claims**



8. Means for releasably mounting printing means upon a movable carriage, said carriage comprising means for receiving said printing means;

said releasable mounting means being secured to said printing means and having a mounting portion;

said means for receiving said printing means comprising:

means defining an elongated slot extending inwardly from one edge of said means for receiving said printing means, and

a supporting portion arranged along said slot and inwardly from said one edge for receiving said mounting portion,

said mounting means comprising an elongated rod slidable within said slot,

said mounting portion comprising an enlarged diameter portion along said rod which is incapable of entering said slot and is adapted to fit into said supporting portion,

said supporting portion comprising a bore of a diameter greater than the width of said slot and adapted to receive said enlarged diameter portion along said rod, and

slidable means comprising a sleeve slidable along said rod and biased toward said enlarged diameter portion to retain said enlarged diameter portion in said bore,

said sleeve having a radially aligned tapped opening and locking means for selectively locking said sleeve to said rod, comprising a threaded member threaded into said opening to engage said rod for locking said sleeve to said rod.

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**4,381,897**

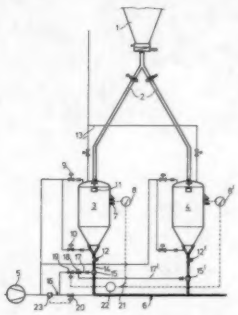
## INSTALLATION FOR TRANSPORTING FINE-GRAINED MATERIAL

**Carlos Arbeletche, Beckum; Ingo Boelcke, Hamm; Peter Poehlmann, Munster, and Klaus Kirchner, Sendenhorst, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany**

**Continuation of Ser. No. 194,032, Oct. 6, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 362,909**

**Int. Cl.³ B65G *53/40***

**U.S. Cl. 406—93** **5 Claims**



1. Apparatus for the continuous transport of fine-grained material from a supply thereof to a consumer, said apparatus comprising at least two pneumatic pressure storage vessels interposed between and communicating with said supply and said consumer, each of said vessels having a discharge pipe containing an outlet valve and a control nozzle in series with said valve; means for alternately opening and closing each of said outlet valves for alternately emptying a selected one of said vessels; conduit means for connecting each of said control nozzles to a source of compressed air for delivering compressed air to each of said control nozzles simultaneously; and air distributor means in said conduit means operable to deliver to the control nozzle in series with the open one of said outlet valves a greater quantity of compressed air than is delivered to the control nozzle in series with the closed one of said outlet valves.

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**4,381,898**

## DEVICE FOR THE CONTROLLED FEEDING OF POWDER MATERIAL

**Anthony J. Rotolico, Hauppauge; Eduardo Romero, Coram, and John E. Lyons, Levittown, all of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.**

**Filed Jan. 21, 1981, Ser. No. 226,756**

**Int. Cl.³ B65G *53/40***

**U.S. Cl. 406—118** **39 Claims**

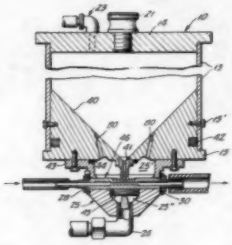
1. A powder-feeding system for gas-propelled delivery of a powder to be supplied in loose particulate form, wherein the

powder has a characteristic angle of repose, said system comprising:

(a) an enclosed hopper for containing a supply of the powder,

(b) a fluidizing chamber beneath said hopper and a restricted vertical passage connecting said chamber to said hopper for gravitational delivery of powder into said chamber,

(c) a fluidizing gas-supply connection to said chamber in vertically downward offset below said vertical passage, said fluidizing gas-supply connection including a gas-permeable porous screen positioned to effectively define the bottom of said chamber so that flow of fluidizing gas supplied to said chamber will be distributed over the area of said screen,



(d) a gas conduit extending through said chamber in the region of said offset and having a carrier-gas supply connection at one end and a gas-propelled powder-delivery connection at its other end,

(e) said gas conduit in the region of said vertical passage having an upwardly directed opening to said chamber for conduct of gas-fluidized powder from said chamber and into said conduit, and

(f) a shed interposed between and in vertically spaced relation from both said passage and said opening, said shed being of such substantially greater overlapping area than said opening in relation to its spacing from said opening that no gravity flow of powder into said chamber can pass into said opening in the absence of a fluidizing gas flow via said fluidizing gas-supply connection.

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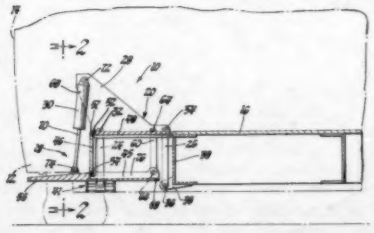
**4,381,899**

## WHEELCHAIR LIFT DEVICE

**Ralph H. Merkle, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 26, 1981, Ser. No. 277,952**
**Int. Cl.³ B60P 1/44**
**U.S. Cl. 414—556** **2 Claims**



1. A wheelchair lift device having a foldable platform assembly located in the stepwell of a motor vehicle for raising and lowering a wheelchair between a first position wherein said platform assembly is in horizontal alignment with an elevated floor portion formed within said motor vehicle and a second position wherein said platform assembly is at ground level; said platform assembly comprising a tread section, a riser section, and a floor section, all of which are pivotally interconnected and adapted to be moved from a step-forming position wherein said floor section is horizontally aligned with said floor portion and said riser section is angularly disposed relative to said tread section and said floor section to a load-supporting position wherein said tread section and said riser section are horizontally aligned with said floor section; a support assembly for said platform assembly, said support assembly including a carriage to which the opposite side edges of said floor section are rigidly connected; a first vertically orientated link member located at each side edge of said floor section and having its upper end pivotally connected to said carriage and its lower end pivotally connected to said tread section, said first link member cooperating with said riser section for maintaining said platform assembly in said step-forming position; second and third vertically orientated link members located along each side of said platform assembly and having their upper ends pivotally connected to said carriage and their lower ends pivotally connected to said motor vehicle; a first actuator carried by said carriage and operatively connected to said tread section for swinging said tread section and said riser section into horizontal alignment with said floor section under the control of said first link member; and a second actuator carried by said motor vehicle and operatively connected to said second link member for swinging said platform assembly from said first position to said second position under the control of said second and third link members.

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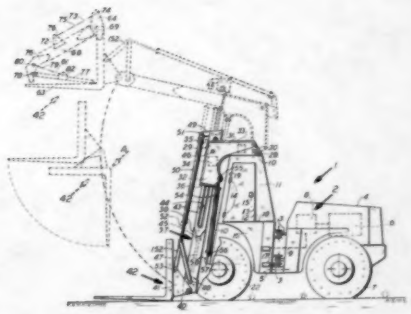
**4,381,900**

## SELF PROPELLED REACHING-TYPE MOBILE LOADER

**Glen N. Schlottman, 18735 Martinique Dr., Houston, Tex. 77058**

**Filed Feb. 12, 1981, Ser. No. 233,636**
**Int. Cl.³ E02F 3/72**
**U.S. Cl. 414—718** **17 Claims**



1. A self propelled reaching type mobile loader including a mobile vehicle having a supporting frame at the front end thereof, with a cab enclosure, and motor means for operating the same, comprising

a pair of laterally spaced pivot supports on said frame adjacent the top of said cab,

a pair of pivoted supporting members each having an L-shaped construction comprising a pair of arms rigidly extending at an angle to each other,

one of the arms on each of said supporting members being supported for pivotal movement on said pivot supports and having an initial position extending substantially horizontally along the top of said cab with the angularly extending arm extending substantially vertically downward a short distance from the top of and in front of said cab,

a pair of supporting boom members supported one on each

of said angularly extending arms of said supporting members, movable longitudinally thereof, and having a substantially fully vertically extended position in said initial position of said pivoted supporting members,

load carrying supporting means supporting on the lower ends of said boom members,

whereby said load carrying supporting means are positioned adjacent to the ground level on which the mobile vehicle is resting with said pivoted supporting members in said initial position and said boom members in said substantially fully vertically extended position,

first actuating means connected to said pivoted supporting members for moving the same to pivot said boom members from said substantially vertical position to a predetermined elevated position, and

second actuating means supported on said pivoted supporting members for extending and retracting said boom members longitudinally of said angularly extending arms in said initial position or in any pivoted position of said pivoted supporting members whereby a load may be lifted vertically in said initial position and extended horizontally from a fully pivoted position.

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**4,381,901**

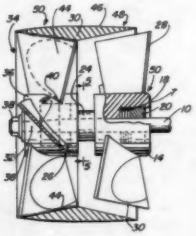
**ANTI-CAVITATION MARINE PROPELLER**

**Russell G. Labudde, 2048 Canterbury Pl., Wheaton, Ill. 60187**

**Continuation-in-part of Ser. No. 67,287, Aug. 17, 1979, abandoned. This application Jun. 3, 1981, Ser. No. 269,842**

**Int. Cl.³ B63H** *1/16, 5/08*

**U.S. Cl. 416—121** **9 Claims**



1. A marine propeller system comprising:

(a) a charging propeller and a discharge propeller mounted end-to-end on a common shaft,

(b) said discharge propeller having a hub secured fast on said shaft and said charging propeller having a hub axially slidable on said shaft,

(c) said charging propeller having driving connection with said discharge propeller,

(d) means for limiting axial movement of said charging propeller, and

(e) a cylindrical tube surrounding said propeller and having an inside surface comprising a pair of truncated cones converging inwardly of the tube in opposed relation and meeting between the ends of the tube to provide a passage therein of less diameter than the ends of said tube,

(f) said tube being mechanically free of said propeller and removable axially relative thereto.

**4,381,902**

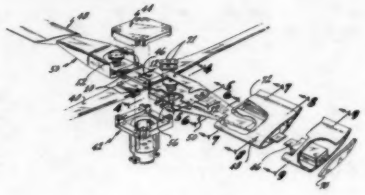
**HELICOPTER TAIL ROTOR OF THE ELASTOMERICALLY-MOUNTED COMPOSITE FLEXBEAM TYPE**

**Robert E. Head, Palos Verdes Estates, and Debashis Banerjee, Sepulveda, both of Calif., assignors to Hughes Helicopters, Inc., Culver City, Calif.**

**Filed Dec. 20, 1979, Ser. No. 105,545**

**Int. Cl.³ B64C** *27/38*

**U.S. Cl. 416—134 A** **14 Claims**



1. In a helicopter rotor of the type in which a flexbeam interconnects blades on opposite sides of a hub and in which the flexbeam is attached to the hub, the improvement comprising:

chordwise damping and coupling means interposed between the flexbeam and the hub for isolating the hub from bending loads encountered by the flexbeam and for coupling said flexbeam to said hub while allowing chordwise movement of said blades and flexbeam,

whereby chordwise resonance frequencies are substantially eliminated.

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**4,381,903**

**OPPOSED PISTON MACHINERY**

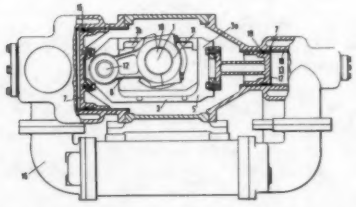
**John E. L. Atkins, Poole, England, assignor to Hamworthy Engineering Limited, Dorset, England**

**Filed Sep. 25, 1980, Ser. No. 190,599**

**Claims priority, application United Kingdom, Sep. 26, 1979, 7933308**

**Int. Cl.³ F04B** *25/00;* **F16H** *21/22*

**U.S. Cl. 417—254** **3 Claims**



1. A reciprocatory machine comprising:

a casing which incorporates two opposed coaxial cylinders;

a respective piston slidable in each cylinder;

a rigid yoke disposed between and rigidly interconnecting said pistons which yoke is a rigid box-like frame having opposite end members, each detachably secured to a respective piston, and four spaced side members rigidly connected to and extending between the said yoke end members, the yoke being supported in the casing solely by the said pistons, the said side members defining between them a first pair of opposed lateral openings and a second pair of opposed lateral openings;

a crank shaft journalled in the housing and extending through said first pair of opposed lateral openings and

having a crank disposed within the yoke and a balance weight on each side of the crank said balance weights also being disposed within the yoke, said second pair of opposed lateral openings accommodating said balance weights on rotation of the crank shaft;

a gudgeon pin mounted in the yoke at one end of the yoke; and

a connecting rod within the yoke, connecting the crank to the gudgeon pin.

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**4,381,904**

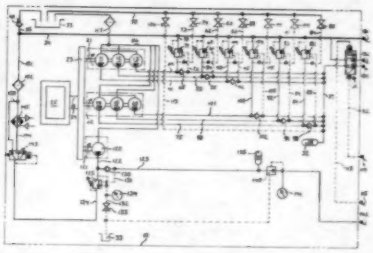
## HYDRAULIC POWER PACK

**Louis D. Kyte, Garland, and Malcolm N. Council, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.**

**Filed Aug. 12, 1980, Ser. No. 177,527**

**Int. Cl.³ F04B *49/08***

**U.S. Cl. 417—287** **16 Claims**



1. A hydraulic power pack for supplying hydraulic fluid to hydraulic piston apparatus comprising: a plurality of positive displacement fixed output hydraulic pumps arranged to be driven simultaneously at a constant speed; a hydraulic fluid input manifold connected with the input ports of said pumps; a hydraulic fluid discharge manifold; a separate discharge line from the discharge port of each of said pumps to said discharge manifold; a check valve in each of said discharge lines to prevent hydraulic fluid flow from said discharge manifold along said discharge line toward said pump; a hydraulic fluid return line; a hydraulic fluid recirculating line connected into each of said discharge lines between said check valve in said discharge line and said pump connected with said discharge line leading to said return line; an unloading valve in each of said recirculating lines; a pilot line from each of said discharge lines between the check valve in said discharge line and said discharge manifold leading to said unloading valve in recirculating line connected into said discharge line for opening and closing said unloading valve responsive to hydraulic fluid pressure in said discharge line between said check valve and said discharge manifold; said unloading valves being set to respond at selected different discharge manifold pressures for sequentially discharging said pumps to said discharge manifold and recirculating said pumps to said return line over a range of combinations of discharge manifold flow rates and pressures; an accumulator connected into said discharge manifold; a dump pressure line; a vent line leading from each of said unloading valves and said recirculating line connected with said unloading valve upstream from said unloading valve into said dump pressure line; and a vent valve in each of said vent lines for venting each of said unloading valves to selectively open each of said unloading valves.

**4,381,905**

## HYDRAULIC TORQUE AMPLIFIER, PARTICULARLY FOR STEERING DEVICES

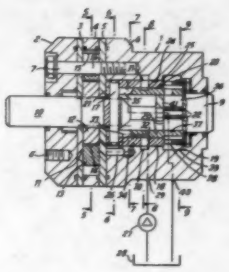
**Hans C. Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Aug. 18, 1980, Ser. No. 178,919**

**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934618**

**Int. Cl.³ F04B *9/10*; F15B *9/10*; F04C *2/10***

**U.S. Cl. 418—61 B** **3 Claims**



1. A hydraulic torque amplifier for steering device or the like, comprising, housing means having interchangeable inlet and outlet ports, input and output shafts rotatably journaled in said housing in a coaxial and axially spaced relation, a planetary piston motor having an externally toothed gear connected to said output shaft and meshing internally toothed gear secured to said housing with movement relative to said housing being limited to orbital and nonrotational motions, the teeth of said gears meshing in sealing engagement to form expanding and contracting cells on opposite sides of the line of eccentricity between said gears, a bore in said housing, said housing having a set of passages with respective communication with said cells and forming a set of circumferentially arranged openings in said bore, and a rotary slide valve arrangement in said bore using said set of bore openings for directing pressurized fluid from said inlet port to said planetary piston motor and exhausting fluid from said motor to said outlet port, said slide valve arrangement having inner and outer sleeves connected respectively to said input and output shafts, said outer sleeve having two sets of alternately arranged commutating passages cooperable with said set of housing bore openings, said inner sleeve having communication with said inlet and outlet ports and being moveable in opposite directions relative to said outer sleeve to selectively connect said inlet and outlet ports to said commutating passages to effect a desired direction of rotation for said output shaft, neutral position spring means between said sleeves for closing said valve arrangement in the absence of torque being applied to said input shaft, and lost motion means between said input and output shaft for limiting relative rotational movement therebetween.

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**4,381,906**

## APPARATUS FOR PRODUCING RAVIOLI AND THE LIKE

**Ugo Mancini, 334 Church St., Mt. View, Calif. 94041**

**Filed Oct. 8, 1981, Ser. No. 309,566**

**Int. Cl.³ B29C *11/00*; B29D *3/00*; A23L *1/16***

**U.S. Cl. 425—106** **9 Claims**

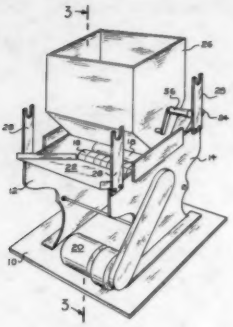
1. An apparatus for the production of ravioli and the like comprising:

(a) support means;

(b) a substantially cylindrical forming roller rotatable around an axis and coupled to said support means, said forming roller being provided with a cutting grid around its curved surface and a plurality of ravioli forming areas

within the interstices of said cutting grid, each ravioli forming area being provided with a centrally located relief surrounded by a first sealing ridge;

(c) a platen roller rotatably coupled to said support means in proximity to said forming roller;



(d) means for rotating at least one of said platen roller and said forming roller; and

(e) means for feeding two sheets of ravioli dough and associated ravioli filling between said forming roller and said platen roller.

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**4,381,907**

## APPARATUS FOR MANUFACTURING INSULATING CONSTRUCTION PROFILES

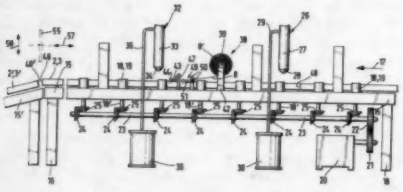
**Klaus Bischlipp, Sprockhövel; Jürgen Pfeiffer, Balve, and Paul Kannert, Ludenscheid, all of Fed. Rep. of Germany, assignors to Eduard Hueck KG, Lüedenscheid, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 129,887, Mar. 13, 1980. This application Dec. 22, 1981, Ser. No. 313,985**

**Claims priority, application Fed. Rep. of Germany, Mar. 4, 1979, 2913254; Oct. 12, 1979, 2941354**

**Int. Cl.³ B29D *27/04***

**U.S. Cl. 425—110** **23 Claims**



**1.** An apparatus for manufacturing insulating construction profiles of the type having two metal profiles spaced from each other to define an open channel therebetween which is filled with a filling material of low thermal conductivity forming insulating cores within said channel, comprising supporting means for supporting a plurality of successive metal strands each having two spaced metal profiles connected to each other with a temporary bridging strip attached to their bottom ends; transport means for advancing said metal strands in their path along said supporting means with a predetermined velocity; first pouring means for introducing said filling material into said channel of said advancing metal strands to form at least one insulating core upon hardening of said filling material; second pouring means for introducing said filling material into said channel to form a second insulating core, said first and second pouring means being positioned along the path of said advancing metal strands, and at least one means for introducing a separating strip into said channel between said first insulating core and said second insulating core to place said separating strip in a vertically spaced relation with said temporary bridging strip; said strip introducing means being positioned in the path of said advancing metal strands between said first pouring means and said second pouring means.

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**4,381,908**

## MOLD APPARATUS FOR FORMING PROFILE EMPLOYING REINFORCING PREFORM

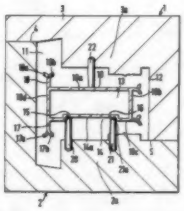
**Manfred Roth, Dautphetal-Mornshausen, Fed. Rep. of Germany, assignor to Werkzeugbau Wolfgruben GmbH, Dautphetal, Fed. Rep. of Germany**

**Continuation of Ser. No. 7,211, Jan. 29, 1979, abandoned, which is a continuation of Ser. No. 810,267, Jun. 27, 1977, abandoned. This application Mar. 5, 1981, Ser. No. 240,708**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628703**

**Int. Cl.³ B29D *27/00***

**U.S. Cl. 425—129 R** **5 Claims**

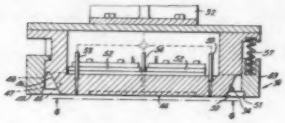


**1.** A horizontally elongated mold having horizontally elongated upper and lower mold parts with a parting plane therebetween for permitting vertical separation between the parts, said parts having cooperating wall means which, when the parts are closed, define a profiled mold cavity which is elongated in the elongated direction of the mold, said wall means including upper and lower walls on said upper and lower parts respectively, a plurality of preform support means mounted on said mold parts at selected fixing points along said elongated direction and projecting into said mold cavity for permitting an elongated reinforcing preform to be fixedly supported within said cavity in spaced relationship to said wall means, said preform support means including first and second pin means fixed to said lower part and projecting substantially vertically upwardly from said bottom wall into said mold cavity, said first and second pin means being laterally spaced apart and defining thereon upper surfaces adapted to supportingly engage a lower surface on the preform, said first and second pin means also defining a pair of oppositely directed side surfaces adapted to respectively engage opposed oppositely directed side shoulders on the preform for preventing transverse movement of the preform relative to the mold, said preform support means also including third pin means fixed to said upper part and projecting substantially vertically downwardly from said upper wall into said mold cavity, said third pin means having a lower surface adapted to supportingly engage an upper surface on the preform for vertically confining the preform between said first, second and third pin means.

## 4,381,909
## APPARATUS FOR FORMING A PAPERBOARD CONTAINER

Dominic D. Ingraffea, Ringwood, N.J., assignor to James River-Dixie/Northern, Inc., Greenwich, Conn.

Continuation of Ser. No. 132,863, Mar. 24, 1980, abandoned, which is a continuation of Ser. No. 968,014, Dec. 11, 1978, abandoned. This application Dec. 16, 1981, Ser. No. 331,353
Int. Cl.³ B29C 17/04
U.S. Cl. 425—387.1 5 Claims



1. In apparatus for forming a drawn paperboard container by application of heat and pressure to a paperboard blank having one side coated with a layer of liquid impermeable material, said apparatus including a mold and mandrel having the shape of the outside and inside, respectively, of said container, means for positioning said blank between said mold and said mandrel so that the side having said layer is presented toward said mandrel, means for relatively moving said mold and said mandrel toward one another to engage said blank and shape the latter in conformity with said mold and said mandrel in fully closed position thereof, and means for heating said mold and mandrel to set the shaped blank to form the container, the improvement comprising:

means operative to heat both said mold and said mandrel to temperatures in a predetermined range in which said paperboard blank is thermally set to form the container, and in which range said coated layer is capable of being damaged by sticking to the mandrel;

means defining elongate slots in said mandrel;

means operative to introduce a compressible fluid through said slots to form a film of said fluid between said mandrel and said coated layer immediately prior to disposition of said mold and said mandrel in the recited fully closed position, whereby to form said container and prevent damage to said layer; and

wherein said mold and said mandrel include mutually confronting, substantially planar portions of generally rectangular configuration disposed and adapted to cooperate to form a bottom wall of said container, and said slots are disposed in, and extend substantially along the periphery of, said planar portion of said mandrel.

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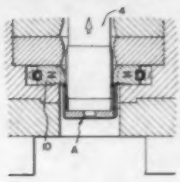
## 4,381,910
## APPARATUS FOR MOLDING PULLEY FOR TOOTHED BELTS

Hideo Matsumoto, Toyota; Minoru Takahashi, Okazaki, and Marehito Kato, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 19, 1982, Ser. No. 350,184
Claims priority, application Japan, Feb. 23, 1981, 56-24310[U]
Int. Cl.³ B29C 17/00; B29D 15/00
U.S. Cl. 425—398 5 Claims

1. In a pressing machine equipped with an upper plate, a lower plate, and a punch attached to the bottom surface of said upper plate for movement, an apparatus for molding a toothed pulley particularly a toothed belt, wherein the improvement comprises that a die holder is provided on said lower plate, and in that a plurality of dies, formed to include tooth molds having



different tooth heights from one die to the next, are arranged in said die holder.

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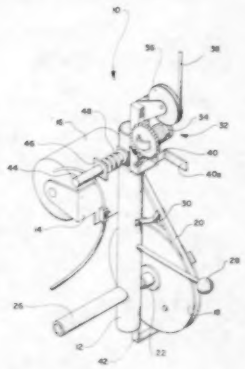
## 4,381,911
## PORTABLE HAND CONTROLLED CEMENT FINISHING MACHINE

Evans Bell, Bunnlevel, N.C. 28323

Filed Apr. 2, 1979, Ser. No. 26,328
Int. Cl.³ A01J 21/00
U.S. Cl. 425—458 12 Claims



1. A portable hand held and controlled cement finishing machine comprising:

(a) a main frame structure including an elongated shaft;

(b) a transverse shaft secured to said elongated shaft and extending outwardly therefrom;

(c) a rotary wheel rotatively journaled on said transverse shaft and rotatable thereon and including an outer radial face;

(d) mounting means secured to said elongated shaft of said main frame at a selected distance from said rotary wheel;

(e) power means mounted on said mounting means;

(f) drive means drivingly interconnecting said power means with said rotary wheel;

(g) finishing means secured to said outer radial face of said rotary wheel for engaging a surface being finished and imparting a finishing action to the surface as said rotary wheel is driven;

(h) a first handle secured to said elongated shaft on the side opposite said rotary wheel and extending outwardly therefrom and in general parallel relationship with said transverse shaft supporting said rotary wheel;

(i) a second handle secured to said elongated shaft in the vicinity of said first handle and extending therefrom;

(j) a cable assembly secured to said main frame for supporting said finishing machine from a selected height while the same is guided and controlled by an operator through said first and second handles; and

(k) squaring arms mounted to said elongated shaft and extending outwardly therefrom on opposite sides of said rotary wheel for squaring the rotary wheel and said finishing means with a surface being finished.

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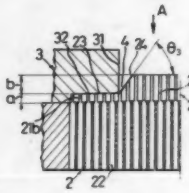
**4,381,912**
**EXTRUSION DIE FOR FORMING A HONEYCOMB STRUCTURE**

**Shinichi Yamamoto, Takahama; Mitsuru Asano, Okazaki; Zituo Suzuki, and Toshihiko Ito, both of Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Jul. 10, 1981, Ser. No. 282,092**
**Claims priority, application Japan, Mar. 25, 1981, 56-43341**
**Int. Cl.³ B29F *3/04***
**U.S. Cl. 425—461** **9 Claims**




1. An extrusion die for forming a honeycomb structure, comprising:

a die body provided with a plurality of disconnected feed passageways having a predetermined depth, which are formed on an inlet side thereof, and interconnected grid-shaped extrusion slots which are formed on an outlet side thereof so as to be communicated with said feed passageways and open to an outlet surface of said die body;

said outlet surface having a central face, an annular stepped face which is formed in the outer peripheral portion of said die body on the upper stream side of said central face so as to cut said extrusion slots in parallel with said central face, and a dropped annular face which is formed between said central face and said stepped face; and

an annular die mask which covers said stepped face of said die body in a position on said upper stream side of said central face of said die body;

said die mask being provided with an annular inner wall extending perpendicularly to said central face;

said inner wall being opposed to said dropped face through an annular opening portion.

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**4,381,913**
**COMBUSTION HEATING SYSTEM**

**Laurence B. Craig, 116 Duck Pond Rd., Glen Cove, N.Y. 11542, and Alfred J. Farina, 1939 Anita Ct., Baldwin, N.Y. 11510**

**Filed Oct. 15, 1980, Ser. No. 197,221**
**Int. Cl.³ F23Q *3/00***
**U.S. Cl. 431—264** **1 Claim**

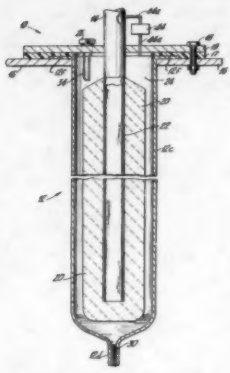
1. In a system having a plurality of heat generation and transfer devices, each having a reactor for generating heat from the combustion of a fuel, and a casing around the reactor to define a combustion chamber, the improvement in an arrangement for igniting each of the heat generation and transfer devices comprising:

a plurality of spark plugs, a separate one of said spark plugs in each of said combustion chambers,

a single spark generator, said spark plugs being connected in electrical parallel across said spark generator,

each of said spark plugs having first and second conductive elements defining a spark gap, one of said conductive elements in each of said spark plugs being a bi-metallic strip,

said bi-metallic strip having relative thermal coefficients such that, in each spark plug, the associated spark plug gap is smaller when at the ambient temperature and greater when at the combustion temperature, and an ignition arrangement of said spark gaps wherein the smallest



of one of said spark gaps at said combustion temperature is greater than the largest of another of said spark gaps at said ambient temperature.

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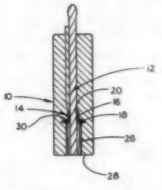
**4,381,914**
**CANDLEWICK**

**Glen E. Ferguson, 2987 E. Austin Way, Fresno, Calif. 93726**

**Filed Oct. 1, 1980, Ser. No. 193,252**
**Int. Cl.³ F23Q *1/00***
**U.S. Cl. 431—267** **10 Claims**




1. An improved candlewick comprising:

elongated wick means having a tip and a tail interconnected by a body portion;

ignitor means having a combustible shank with a head ignitable by frictional contact on one end and a stump on the other end, said ignitor means being juxtaposed said wick means with said shank paralleling said wick body portion and said heat adjacent said wick tip;

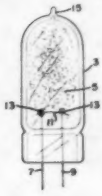
a base means having a neck and a flange, said neck having a recess having a longitudinal axis and being disposed to receive said tail of said wick means and said shank of said ignitor means and retain the same in close proximity and in general alignment with said longitudinal axis, and said flange being disposed to extend radially outward from said neck normal to the longitudinal axis of said recess; and

spacer means disposed in supporting relationship with said base means, said spacer means being of heat insulating material and having height sufficient to elevate said base means above a candleholder or supporting surface a distance adequate to prevent heat damage thereto from the burning of said wick means.

## 4,381,915
## FILAMENT-TYPE LAMP PRIMER AND FABRICATION PROCESS

Thomas L. Gavenonis, Montoursville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 27, 1981, Ser. No. 247,978
Int. Cl.³ F21K 5/00
U.S. Cl. 431—362 14 Claims

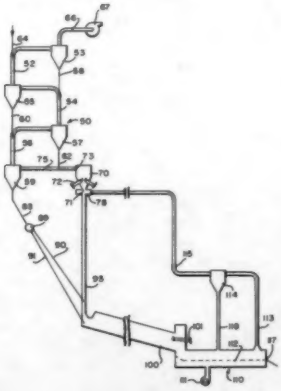


1. A filament-type photoflash lamp having a combustion-supporting gas and shredded metal fill contained within a glass envelope with a pair of electrically conductive leads hermetically sealed to and passing through said envelope and interconnected by a filament wire interiorly of the envelope, the improvement comprising a primer including a percussively-ignitable material and a powdered combustible incandescible material disposed within said envelope and responsive to heat generated upon energization of said filament wire to effect activation thereof and of said shredded metal fill whereby the time for initiating actinic light production is reduced.

## 4,381,916
## METHOD AND APPARATUS FOR ROASTING FINE GRAINED ORES

Jay Warshawsky, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Sep. 11, 1981, Ser. No. 301,163
Int. Cl.³ F27B 15/00, 7/02; C04B 7/02
U.S. Cl. 432—14 13 Claims



6. A method of thermal processing fine grained ore comprising the steps of:

providing a furnace for calcining the fine grained ore;

supplying sufficient fuel and gas for combustion to said furnace to maintain within said furnace a temperature at which the ore to be calcined will be substantially calcined;

supplying raw fine grained ore to be processed to an independent mixing zone where the ore to be processed is mixed with hot gases;

supplying the ore to be processed and hot gases to said furnace and maintaining said ore in suspension within the furnace;

discharging in a stream spent combustion gas and suspended at least partially calcined ore from said furnace;

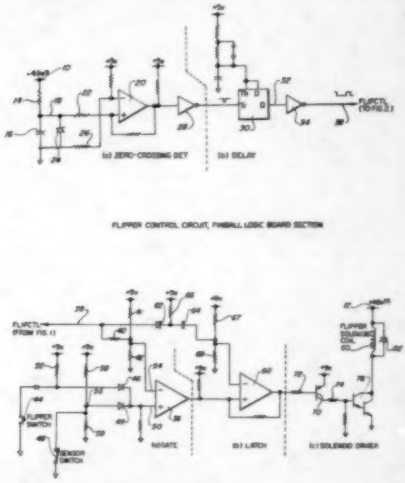
separating the spent combustion gas from the at least partially calcined ore; and

recirculating a portion of the separated at least partially calcined ore to said independent mixing zone and then to said furnace for further calcination.

## 4,381,917
## GUIDE ACCESSORY FOR A DRILL MOUNTED ON DENTAL HAND-TOOL

Angelo Sargenti, Locarno, Switzerland, assignor to Micro-Mega S.A., Besancon, France

Filed Feb. 12, 1982, Ser. No. 348,602
Int. Cl.³ A61C 1/10, 3/00
U.S. Cl. 433—114 8 Claims



1. A tissue stabilizing accessory for a dental hand drill having a drill bit and employed essentially for drilling through the gum and bony cortex of the jaw comprising:

a mounting member for fixedly securing the accessory to the dental drill for non-rotatable movement therewith;

compression spring means fixedly supported on said mounting member for coaxial alignment with the drill bit in spaced relationship thereto and;

a tissue compressing pressure foot fixedly mounted on said spring means remote from said mounting member and having a tissue contacting face for engagement with the gum and an axial bore only slightly larger in diameter than the drill bit and extending centrally through said face, said pressure foot being configured so as to impart controlled pressure through said compression spring means to the gum engaged by the tissue contacting face adjacent said bore.

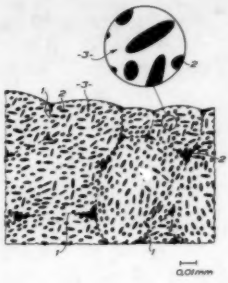
4,381,918

## METHOD OF PRODUCING A COMPOSITE RESIN, PREFERABLY FOR USE AS A DENTAL MATERIAL

Lars E. M. Ehrnford, 31 Sunekullavagen, 217 14 Malmo, Sweden

Continuation-in-part of Ser. No. 226,636, Jan. 21, 1981, which is a continuation of Ser. No. 777,909, Mar. 15, 1977, abandoned. This application Sep. 17, 1981, Ser. No. 302,995
Claims priority, application Sweden, Mar. 16, 1976, 7603313
Int. Cl.³ A61K 6/08
U.S. Cl. 433—199 37 Claims

1. A method of producing a dental restoration composite containing an organic resin and inorganic porous particles which comprises impregnating open porous inorganic particles with an at least partially hardenable resin material, compressing in such a way that the particles contact each other and the pressure in the resin is equalized by viscous flow of excess resin through the pores of the inorganic particles, bonding together by hardening of at least a portion of the hardenable resin material thereby forming a resin structure including a polymer impregnated contiguous inorganic phase wherein the porous inorganic particles comprise a rigid three-dimensional network of inorganic fibers fused together by heating at a temperature sufficient to cause melting and complete fusing together of substantially all individual fibers at their points of contact into a network where the porosity is continuous throughout the network.



4,381,919

## HAIR DYE COMPOSITION CONTAINING QUATERNIZED POLYMERS

Bernard Jacquet, Antony, and Gerard Lang, Epinay-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

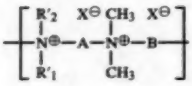
Continuation-in-part of Ser. No. 899,467, Apr. 24, 1978, Pat. No. 4,197,865, which is a continuation of Ser. No. 702,924, Jul. 6, 1976, abandoned. This application Dec. 10, 1979, Ser. No. 101,562

Claims priority, application Luxembourg, Jul. 4, 1975, 72901; Nov. 13, 1975, 73792

Int. Cl.³ D06D *5/00*

U.S. Cl. 8—405 17 Claims

1. A hair dye composition comprising a cream or gel a carrier a quaternized polymer having recurring units of the formula



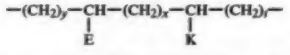
wherein

$X^{\ominus}$ represents an anion derived from an organic or mineral acid,

$R'_2$ is an aliphatic radical having a maximum of 20 carbon atoms,

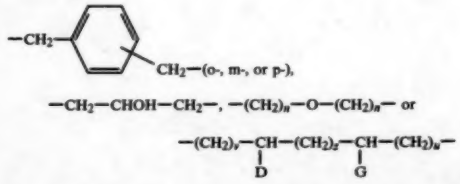
$R'_1$ is alkyl having 2–20 carbon atoms, cycloalkyl having 5 or 6 carbon atoms or phenylalkyl wherein the alkyl moiety has 1–3 carbon atoms, or $R'_1$ and $R'_2$ together represent a polymethylene radical having 4 or 5 carbon atoms or $-(CH_2)_2-O-(CH_2)_2-$,

A represents a divalent group of the formula



wherein x, y and t are whole numbers ranging from 0 to 11 and being such that the sum (x+y+t) is greater than or equal to 0 and less than 18, and E and K represent hydrogen,

B represents a divalent group of the formula



wherein D and G represent hydrogen and v, z and u are whole numbers ranging from 0 to 11, two of them being able to be simultaneously equal to 0 such that the sum (v+z+u) is greater than or equal to 1 and lower than 18, and such that the sum (v+z+u) is greater than 1 when the sum (x+y+t) is equal to 0, and n is a whole number equal to 2 or 3, said polymer being present in an amount between 0.25 and 10 weight percent of said composition, and an effective amount of hair dye to color the hair.

4,381,920

## METHOD AND COMPOSITION FOR DYEING HUMAN HAIR

David Garlen, Roselle Park, N.J., assignor to Michael-David Laboratories, Roselle Park, N.J.

Continuation-in-part of Ser. No. 63,443, Aug. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 929,670, Jul. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 741,513, Nov. 15, 1976, abandoned. This application Aug. 20, 1981, Ser. No. 294,569

Int. Cl.³ D06P *3/52*

U.S. Cl. 8—406 1 Claim

1. A method of dyeing human hair which comprises the steps of:

(1) application to the hair of a hair color formulation comprising:

(a) an oil-in-water emulsion of 5 to 20 parts by weight of oil in 80 to 95 parts by weight of water;

(b) p-phenylenediamine at a concentration of about 0.5% to about 1.5% of the weight of the oil-in-water emulsion;

(c) 4-chlororesorcinol as a dye color modifier, in quantity equal to 10% to 50% of the weight of the p-phenylenediamine;

(d) an inert white pigment suspended in the emulsion at a concentration of about 0.2% to about 1% of the weight of the total formulation; and

(e) an antioxidant in quantity sufficient to prevent premature oxidation of the p-phenylenediamine oxidation dye intermediate when packaged out of contact with air;

(f) the total quantity of oxidation dye intermediates being not greater than 1.5% of the total weight of the formulation and

(g) the pH of said formulation being between 7.0 and 8.3,

(2) allowing said formulation to remain on the hair for 15–30 minutes,

(3) rinsing off the excess, and

(4) application of an excess of dilute hydrogen peroxide which is allowed to remain on the hair for 5–15 minutes and then rinsed off.

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4,381,921

## ELEMENT, STRUCTURE AND METHOD FOR THE ANALYSIS OR TRANSPORT OF LIQUIDS

Zona R. Pierce, and David S. Frank, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 973,669, Dec. 27, 1978, Pat. No. 4,258,001. This application Oct. 2, 1980, Ser. No. 193,508

Int. Cl.³ G01N *31/22, 33/52, 33/54, 33/68*

U.S. Cl. 436—535 11 Claims

1. A method for the analysis of an analyte contained in a liquid, said method comprising

(a) contacting together said liquid and an element having a support bearing a particulate structure comprising

(i) a plurality of heat-stable, organo-polymeric particles non-swellable in and impermeable to said liquid, said particles having a particle size of from about 1 to 200 microns, and

(ii) an adhesive, an amount less than 10 percent by weight of said particles, comprising an organic polymer differ-

ent from that of said particles and insoluble in said liquid, substantially all of said adhesive concentrated on surface areas of adjacent particles where said adjacent particles are in closest proximity bonding said particles into a coherent, three-dimensional lattice non-swellable in said liquid with interconnected void spaces among particles of said lattice to provide transport of said liquid, said lattice having a void volume of from about 25 to 80 percent,

the analyte, or a reaction product of said analyte, interacting with the element to produce a detectable change within the element; and

(b) detecting said change to determine the presence and/or concentration of said analyte.

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**4,381,922**

## COMBUSTION DETECTING DEVICE USING METALLO-PHTHALOCYNINE SEMICONDUCTOR AND PROCESS OF PREPARING SAME

**Yvan A. R. Frey, Rue de la Coupe 22, 7000 Mons, and Andre P. Z. De Haan, Avenue Lemiex 35, 7020 Mons-Hyon, both of Belgium**

**Continuation-in-part of Ser. No. 9,158, Feb. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 884,402, Mar. 8, 1978, abandoned. This application Apr. 28, 1981, Ser. No. 258,516**

**Claims priority, application Luxembourg, Mar. 11, 1977, 76937**

**Int. Cl.³ G01M *27/62***

**U.S. Cl. 422—98** **14 Claims**

1. Process of making a device for detecting combustion products and effects resulting from combustion which comprises:

preparing a composition of metallo-phthalocyanine, in amorphous or crystalline form, selected from the group consisting of $Fe_{II}Pc$, $Fe_{III}Pc$, $Cu_{II}Pc$, CuPc-$CCl_4$ where Pc represents phthalocyanine,

mixing said metallo-phthalocyanine composition in powder form with a carbon-containing liquid solvent selected from the group consisting of carbon tetrachloride, ether and acetone, allowing said metallo-phthalocyanine composition to remain in said solvent for a period of time to modify its initial phthalocyanine molecule and stirring said mixture to obtain a homogeneous suspension of the modified metallo-phthalocyanine composition powder in said solvent,

applying a thin uniform coating of said suspension in a selected pattern on an insulating substrate and drying said coating to form a resistance-element having a resistance of $10^6$ ohms to $10^{10}$ ohms, and

providing electrical contacts for connecting said resistance element in an electrical circuit for measuring the electrical resistance of said resistance element and thereby detecting change in electrical resistance produced by exposure to combustion products and effects resulting from combustion,

a finely ground buffer selected from the group consisting of silicagel and a molecular sieve being saturated with water and mixed with said metallo-phthalocyanine composition before said composition is applied to said substrate.

**4,381,923**

## ISOTOPE SEPARATION WITH AN INFRARED LASER

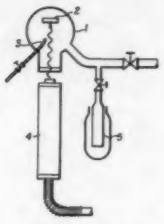
**Kazuhiro Wada, c/o Kyoto University, Kohgaku-bu, Yoshida Honmachi, Sakyo-ku, Kyoto, Japan**

**Continuation-in-part of Ser. No. 8,588, Feb. 1, 1979, abandoned, which is a continuation of Ser. No. 779,762, Mar. 21, 1977, abandoned. This application Oct. 31, 1979, Ser. No. 89,986**

**Claims priority, application Japan, Sep. 20, 1976, 51/113256**

**Int. Cl.³ B01D *59/00***

**U.S. Cl. 23—293 R** **20 Claims**



1. A method of separating isotopes using an infrared laser, comprising:

diluting a gaseous isotopic mixture of compounds from which a specific isotope compound is to be separated from all other isotope compounds with an inert diluent gas which is transparent to the infrared radiation from said laser;

condensing said isotopic mixture with the diluent gas as a condensed layer on a cold surface; and

irradiating said condensed gases with infrared radiation from said laser of a wave length which selectively excites the isotope compound desired to be separated, thereby achieving the desired separation by the migration of the energized isotope compound toward the cold surface.

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**4,381,924**

## PROCESS FOR SLUICING RESIDUES FROM THE PRESSURE SYSTEM OF A PRESSURE GASIFICATION TANK

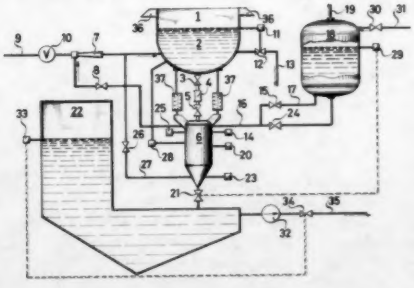
**Volkmar Schmidt, Oberhausen; Bernhard Lieder, Bottrop; Heinrich Scheve, Oberhausen, and Hans Dohren, Krefeld, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Continuation of Ser. No. 53,884, Jul. 2, 1979, abandoned. This application Mar. 20, 1981, Ser. No. 245,778**

**Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829629**

**Int. Cl.³ C10J *3/00***

**U.S. Cl. 48—197 R** **3 Claims**



1. In a process for periodically sluicing residues which are produced from gasifying ash-containing fuels with oxygen or

an oxygen-containing composition under a pressure of 10 to 200 bars wherein ash is granulated in a water bath connected to a gasification chamber, suspended in water and passed into a non-pressurized collecting vessel, the improvement which comprises:

A. Discharging the residue from said water bath, which is maintained in fluid communication with said gasification chamber, to a lock vessel, said lock vessel being connected to a process water feed line through which process water flows to said water bath by a normally closed pressure equalizing line, said lock vessel being connected to a surge tank which contains water so that the lock vessel remains constantly filled with water,

B. Periodically interrupting said discharging of residue into the lock vessel and depressuring said lock vessel during said interruption and removing liberated gases (previously dissolved in the water) and steam therefrom by opening a connection between said lock vessel and said surge tank,

C. Discharging suspended and granulated residues from said depressurized lock vessel into a pressureless collecting vessel by flushing said depressurized lock vessel with an adjustable amount of water flowing from said surge tank,

D. Adjusting the water level in the collecting vessel during the time the depressurized lock vessel is open so that the water level is sufficiently high such that no gas penetrates the depressurized lock vessel from the outside and the water level in the depressurized lock vessel does not sink, and then

E. Resuming the discharging of the residue by equalizing the pressure between said lock vessel, and said water bath by opening said normally closed pressure equalizing line and admitting water therein.

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**4,381,925**

## GRINDING DISK

**Karl Colleselli, Schwaz, Austria, assignor to Tyrolit-Schleifmittelwerke Swarovski KG, Schwaz, Austria**

**Filed Jan. 29, 1981, Ser. No. 229,673**

**Claims priority, application Austria, Apr. 1, 1980, 1754/80**

**Int. Cl.³ B24D *3/34***

**U.S. Cl. 51—298** **15 Claims**

1. In an abrasive article comprising abrasive grains, a bonding agent, and an active filler, the improvement wherein at least a part of the active filler is graphite of a lamellar structure, acting as a supporting grid, having an intercalated guest component selected from the group consisting of a metal, a metal halide, a metal sulfide, a transition metal hydride, a transition metal carbide, a transition metal nitride and elemental sulfur.

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**4,381,926**

## METHOD AND APPARATUS FOR REGULATING AMMONIA CONCENTRATION DURING SCRUBBING OF GASEOUS MIXTURES

**Heinz Karwat, Pullach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Sep. 24, 1981, Ser. No. 305,220**

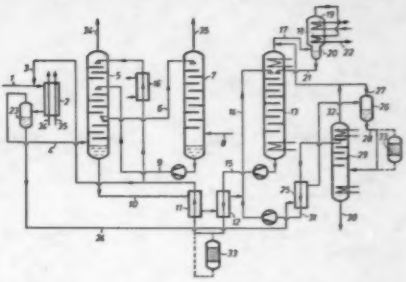
**Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036936**

**Int. Cl.³ B01D *53/14, 19/00***

**U.S. Cl. 55—48** **23 Claims**

1. A method for scrubbing gaseous mixtures containing ammonia and acidic gases which comprises contacting said gaseous mixture with methanol in a scrubbing column so as to remove a portion of said acidic gases therefrom and produce a methanol stream containing at least a portion of said ammonia, separating said methanol stream containing said at least a portion of said ammonia from said acidic gases, contacting at least a portion of said methanol stream with an ion exchange material so as to remove at least a portion of said ammonia therefrom, and recirculating said methanol stream to said scrubbing column.

15. Apparatus for scrubbing gaseous mixtures containing ammonia and acidic gases comprising a scrubbing column for contacting said gaseous mixtures with methanol so as to remove a portion of said acidic gases from said gaseous mixture and produce a methanol stream containing at least a portion of said ammonia, a methanol recovery column for separating said methanol stream containing said at least a portion of said ammonia from said acidic gases, first methanol delivery means for delivering said methanol stream containing said at least a portion of said ammonia from said scrubbing column to said methanol recovery column, ion exchange means for contacting at least a portion of said methanol stream with an ion exchange material so as to remove at least a portion of said ammonia therefrom, second methane means for delivery means for delivering said methanol stream containing said at least a portion of said ammonia from said methanol recovery column to said ion exchange means, and recirculation means for recirculating said separated methanol to said scrubbing column.



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**4,381,927**

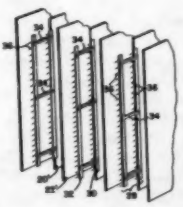
## CORONA ELECTRODE APPARATUS

**Charles G. Noll, Gahanna, Ohio, assignor to United McGill Corporation, Columbus, Ohio**

**Filed Apr. 23, 1981, Ser. No. 256,931**

**Int. Cl.³ B03C *3/00***

**U.S. Cl. 55—138** **11 Claims**



1. For use in an electrostatic precipitator of the parallel and vertical plate type with lateral gas flow paths between the plates, an electrode apparatus, including a plurality of flat collecting plates spaced apart at equal distances, comprising, on at least one of said flat collecting plates: a first corona electrode with a first elongated body portion and plural spaced apart needles mounted along said first elongated body portion and disposed parallel with the gas flow path; at least one second corona electrode having a second elongated body portion; means for mounting said first corona electrode and said said second corona electrode so as to maintain said second elongated body portion parallel with said first elongated body portion and at a predetermined distance from the needles on said first elongated body portion, such distance being substantially equal to the spacing between said spaced apart, parallel flat collecting plates, said two elongated body portions being in parallel disposition in the same plane with said at least one flat

plate: said mounting means including means for securing said two corona electrodes in a common electrically conductive manner to a vertical edge of said plate; and a D.C. electrical source connected to and for maintaining said at least one collecting plate and the associated said first and second corona electrodes at the same potential.

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**4,381,928**

## APPARATUS FOR VENTING AND/OR DEGASSING A PIPELINE SYSTEM

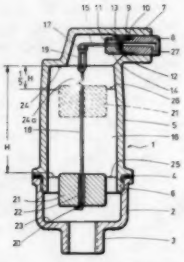
**Franciscus Roffelsen, Helmond, Netherlands, assignor to Spiro Research B.V., Helmond, Netherlands**

**Filed Mar. 24, 1981, Ser. No. 247,161**

**Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012078**

**Int. Cl.³ B01D *19/00***

**U.S. Cl. 55—170** **39 Claims**



1. Apparatus for venting and/or degassing such as the absorption degassing of a pipeline system including a liquid circuit, in particular a water circuit, comprising an upwardly extending casing having an upper end and a lower end, a valve mounted in said casing adjacent the upper end thereof with said valve communicating between the interior and exterior of said casing, a valve needle mounted in said valve and extending into said casing adjacent the upper end thereof, said valve needle extending transversely of the upward direction of said casing, an upwardly extending float needle located within said casing and disposed in contacting engagement with said valve needle, a float suspended on and movable in the upward direction on said float needle, wherein the improvement comprises that said casing comprises an upwardly extending top part forming the upper end of said casing and a bottom part extending downwardly from the lower end of said top part, said top part containing said valve float needle and float, a cap extending transversely of the upward direction of said casing in the region of the lower end of said top part, said cap having at least one opening therethrough affording communication between the interior of said bottom part and top part, said float needle extending upwardly from the region of said cap to said valve needle, and said top part and float needle being dimensioned so that said float moves upwardly and downwardly freely on said float needle from the region of said cap toward said valve needle so that during a pressure increase within said casing up to a predetermined value an accurate safety distance is maintained between the liquid surface in said casing and said valve, and said valve having a labyrinth outlet port for preventing valve damage or contamination from the exterior of said casing.

**4,381,929**

## APPARATUS FOR ADSORBING FUEL VAPOR

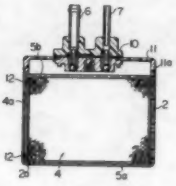
**Junzi Mizuno, Okazaki; Yukihisa Takeuchi, Aichi; Akira Fukami, Okazaki; Masao Wakayama, Nagoya, and Masahiro Tomita, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Apr. 22, 1981, Ser. No. 256,663**

**Claims priority, application Japan, Apr. 25, 1980, 55/55864; Jun. 9, 1980, 55/78043**

**Int. Cl.³ B01D *53/04***

**U.S. Cl. 55—316** **5 Claims**



1. An apparatus for adsorbing fuel vapor comprising:

a container having side walls and opposed ends; a fuel vapor inlet in one of said ends for introducing the fuel vapor into the container; a gas outlet in the other if said ends for taking the air-fuel mixture out from the container; and air inlet for introducing the air into the container for desorbing the fuel vapor; an adsorbent being set in the container, for adsorbing the fuel vapor said adsorbent containing a foamed body of active charcoal constituting a three-dimensional network cell structure having an inner communicating space; and a thin sleeve of active charcoal snugly surrounding the foamed body between the latter and said side walls.

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**4,381,930**

## CYCLONE SEPARATOR FOR SEPARATING PARTICULATE MATERIAL, IN PARTICULAR SEED, FROM AN AIR FLOW

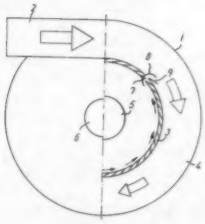
**Jens O. E. Hansen, Fuglebjerg, Denmark, assignor to Kongskilde Koncernselskab A/S, Soro, Denmark**

**Filed May 18, 1982, Ser. No. 379,459**

**Claims priority, application Denmark, Jun. 12, 1981, 2578/81**

**Int. Cl.³ B01D *45/12***

**U.S. Cl. 55—339** **3 Claims**



1. A cyclone separator for separating particulate material, such as seed, from an air flow, comprising

a separator casing having a circumferential wall forming the radially outer boundary of a whirl chamber,

an axial air outlet from said casing, and

a filter member arranged between said circumferential wall and said outlet and forming a radially inner boundary of said whirl chamber,

said filter member comprising a shell of louvred plate, the slits of which reckoned radially outwardly incline in the intended rotational direction of the air entering said whirl chamber, and said plate having at least one slot extending

over at least part of the axial length of the shell and associated with an ejector rail protruding on the inner surface of said shell and adapted to remove the outer portions of a counter-rotating volume of air inside said shell and to recycle the removed air and particulate material contained therein into said whirl chamber.

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**4,381,931**

## PROCESS FOR THE MANUFACTURE OF SUBSTANTIALLY PORE-FREE SHAPED POLYCRYSTALLINE ARTICLES BY ISOSTATIC HOT-PRESSING IN GLASS CASINGS

**Klaus Hunold, Kempten; Klaus Reinmuth, Durach, and Alfred Lipp, Bad Worishofen, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany**

**Filed Sep. 23, 1981, Ser. No. 304,948**

**Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040771**

**Int. Cl.³ B22F *3/14***

**U.S. Cl. 65—18.1** **8 Claims**

1. In a process for the manufacture of substantially pore-free shaped polycrystalline articles from pulverulent material or from articles preformed therefrom that have pore open at the surface, by isostatic hot-pressing, the article being sealed under vacuum in a glass casing, in a high pressure autoclave using an inert gas as a pressure-transfer medium, the improvement which comprises contacting the glass-encased powders or articles with a heat-resistant pulverulent material which is permeable to the pressure-transfer medium and which penetrates into the surface of the glass or reacts with it when the glass casing softens during the heating-up operation in the isostatic hot-pressing process, whereby the glass casing is reinforced from the outside at the isostatic pressing temperature.

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**4,381,932**

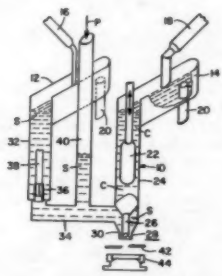
## LAMINATED GOB FOR PRESSING GLASS ARTICLES

**John H. Olson, Newport News, Va., and Robert J. Schlaufman, Elmira, N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed May 1, 1981, Ser. No. 259,395**

**Int. Cl.³ C03B *17/00, 7/00***

**U.S. Cl. 65—66** **8 Claims**



1. A method of forming a laminated charge of molten glass having a core of one glass and a skin of a second glass which not only completely surrounds said core glass but has a reentrant portion extending inwardly within the core glass from a circumferential peripheral portion of such charge which comprises, providing a supply of molten core glass to a central portion of a discharge orifice, providing a separate supply of molten skin glass to said discharge orifice so as to surround the flow of core glass from a central portion of said orifice with said skin glass, applying a force to the core glass being supplied to the discharge orifice and thereby urging an increased flow of core glass from a central portion of said discharge orifice over that which would flow by gravity under a steady state condition while simultaneously permitting the skin glass supplied to said orifice to flow by gravity at a steady state rate about the flow of core glass, momentarily interrupting and reversing the force applied to said core glass and thus retarding the flow of core glass from the central portion of said discharge orifice while substantially simultaneously providing a pulsed force to the skin glass being supplied to said discharge orifice and thus urging the skin glass into a void created by the retarded core glass flow, resuming the force applied to the core glass supplied to the discharge orifice and substantially simultaneously terminating the pulsed force applied to the skin glass supplied to the discharge orifice, and severing the resultant laminated gob from the flow emanating from the discharge orifice in such a manner to form the laminated charge.

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**4,381,933**

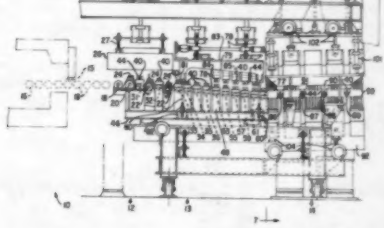
## METHOD AND APPARATUS FOR SHAPING MOVING GLASS SHEETS BY SAGGING FOLLOWED BY ROLL PRESSING

**Stephen J. Schultz, Pittsburgh, Pa., and Terry L. Wolfe, Evansville, Ind., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jan. 25, 1982, Ser. No. 345,494**

**Int. Cl.³ C03B *23/033***

**U.S. Cl. 65—106** **24 Claims**



1. A method of shaping a glass sheet comprising

heating the sheet to its deformation temperature in a furnace,

conveying said sheet along a path of travel beyond said furance while said sheet remains hot over a series of rotating forming rolls shaped to transverse elevational shape to sag the sheet by gravity to conform approximately to the transverse elevational shape of the last forming roll in said series, and

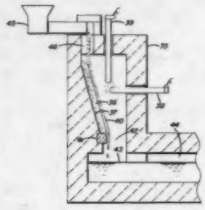
inhibiting the formation of tip curl in the vicinity of the transverse side edge portions of said gravity sagged sheet by pressing said sheet between a plurality of pairs of additional rotating forming rolls of complementary transverse elevational shape arranged with diminishing space between the rolls of each successive pair of said additional rotating forming rolls along said path of travel wherein the space between the last of said pairs of additional rotating forming rolls barely exceeds the thickness of said glass sheet.

15. Apparatus for shaping a glass sheet comprising a furnace and a roll forming section, said roll forming section comprising an upstream portion having a plurality of rotatable forming rolls shaped in transverse elevation and a downstream portion comprising a plurality of pairs of closely spaced, rotatable forming rolls of complementary shape arranged along a path of travel, the space between the rotatable forming rolls of said plurality of pairs diminishing in a downstream direction along said path of travel.

## 4,381,934
## GLASS BATCH LIQUEFACTION

**Gerald E. Kunkle, New Kensington, and Joseph M. Matesa, Holiday Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jul. 30, 1981, Ser. No. 288,581**
**Int. Cl.³ C03B 5/10**
**U.S. Cl. 65—135** **36 Claims**



1. A method of liquefying glass batch comprising:
in a vessel having a cavity surrounded by sidewalls, an upper inlet end portion, and a lower outlet end portion, maintaining a lining on the interior of the sidewalls comprised of a stable layer of glass batch;
feeding glass batch into the vessel at the inlet end portion so as to form a transient layer of glass batch on the stable layer lining;
providing heat to the cavity to render the transient batch layer to a molten fluid which flows on the stable batch layer lining toward the outlet end and out of the vessel through an outlet opening in the outlet end portion; and
replenishing the transient glass batch layer by feeding additional glass batch onto the stable batch layer at a rate sufficient to maintain the stable batch layer lining substantially constant at a sufficient thickness to thermally protect the vessel from the heat within the cavity.

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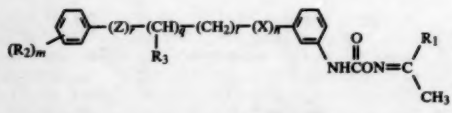
## 4,381,935
## OXIMECARBAMATE DERIVATIVES, AND THEIR PRODUCTION AND USE

**Yoshiaki Kosuge, Hyogo; Ryo Yoshida, Kawanishi; Seizo Sumida; Hirofumi Oshita, both of Hyogo; Soji Otsuki, Sonehigashimachi, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Division of Ser. No. 65,838, Aug. 13, 1979, Pat. No. 4,315,768. This application Nov. 3, 1981, Ser. No. 317,889**
**Claims priority, application Japan, Aug. 25, 1978, 53-104127**
**Int. Cl.³ A01N 43/08, 47/20; C07C 131/105, 317/48**
**U.S. Cl. 71—88** **10 Claims**

1. A compound of the formula:



wherein $R_1$ is methyl or methoxy, $R_2$ is lower alkyl, lower alkoxy, methylenedioxy, methylthio, halogen or trifluoromethyl, $R_3$ is hydrogen, methyl or ethyl, X and Z are each oxygen or sulfur, m is an integer of 0 to 5 when $R_2$ is fluorine only or an integer of 0 to 3 when any $R_2$ is other than fluorine, $R_2$ being same or different in case of m being an integer of 2 or 3, n and r are each an integer of 0 or 1 but when one of them is zero, the other is not zero, q is an integer of 0 or 1 and t is an integer of 0 to 4 with the proviso that when $R_2$ is other than methylenedioxy, $R_1$ is not methyl.

9. A herbicidal composition which comprises as an active ingredient a herbicidally effective amount of the compound according to claim 1 and a carrier therefor.

10. A method of selectively combating weeds in cultivation of soybean, cotton, sugar beet, rice or wheat, which comprises applying a herbicidally effective amount of the compound according to claim 1 to the area wherein the soybean, cotton, sugar beet, rice or wheat is cultivated.

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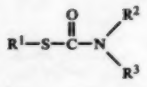
## 4,381,936
## HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

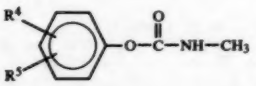
**Daniel L. Hyzak, Saratoga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.**

**Division of Ser. No. 136,146, Mar. 31, 1980, Pat. No. 4,299,616. This application Jul. 20, 1981, Ser. No. 284,412**
**Int. Cl.³ A01N 25/22**
**U.S. Cl. 71—100** **12 Claims**

1. An herbicidal composition comprising
(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which $R^1$, $R^2$ and $R^3$ are independently $C_2$–$C_4$ alkyl; and
(b) an amount of a carbamate having the formula



in which $R^4$ and $R^5$ conjointly form $C_1$–$C_4$ alkylenedioxy, the amount of said carbamate being sufficient to extend the soil life of said thiolcarbamate; and
(c) an inert carrier.

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## 4,381,937
## METHOD FOR PRODUCING COBALT METAL POWDER

**Richard G. Gingerich; Clarence D. Vanderpool; Richard A. Scheithauer, and Martin B. MacInnis, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Sep. 21, 1981, Ser. No. 304,400**
**Int. Cl.³ B22F 9/00**
**U.S. Cl. 75—0.5 AA** **3 Claims**

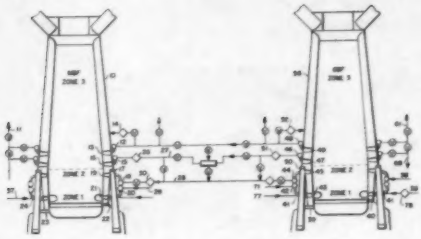
1. A process for producing fine particle size cobalt metal powder from scrap material comprising cobalt and silver, said process comprising digesting said scrap material in aqueous hydrochloric acid to produce an aqueous acid cobalt chloride solution containing silver ions, complexing cobalt present in said aqueous acid cobalt chloride solution with ammonia to form a cobalt ammine chloride solution, contacting said cobalt ammine chloride solution at a pH of about 7 with a sufficient amount of alkali metal bromide or alkali metal iodide wherein the alkali metal is lithium, sodium or potassium, to form a silver metal bromide or silver iodide precipitate, removing said precipitate from the resulting cobalt ammine chloride solution, forming a cobalt containing precipitate, and reducing said cobalt containing precipitate to form a cobalt metal powder.

**4,381,938**

## MULTI-PURPOSE ZONE CONTROLLED BLAST FURNACE AND METHOD OF PRODUCING HOT METAL, GASES AND SLAGS

**H. Bruce Claflin, 2436 Park Blvd., Upland, Calif. 91786**

**Filed Jun. 12, 1980, Ser. No. 158,709**
**Int. Cl.³ C21B 5/06**
**U.S. Cl. 75—42** **24 Claims**



1. A method of controlling a molten iron-producing blast furnace having three zones, zone 1 being in front of the primary tuyeres, zone 2 being the balance of the bosh extending from the crucible to the mantel, and zone 3 extending above the mantel, said blast furnace having at least three sets of tuyeres, and wherein a charge is introduced into the top of the furnace, is preheated, iron oxides are reduced to iron as the charge moves downwardly through zone 3, and is melted in zone 2, which method comprises:

(a) introducing into the top of the furnace a charge containing a iron oxide, flux and from about 460 to about 570 pounds of coke per ton of hot metal, said coke providing a carbonaceous grate and the major portion of the fuel for high temperature heat above about 1000° C. in zones 1 and 2;

(b) burning coke in said charge in zone 1 with oxygen-enriched air introduced through said primary set of tuyres to produce a high temperature gas to melt iron and slag in zone 2 and introducing a reducing gas through tuyeres located in zone 2 to provide an upwardly moving gas stream whose temperature is reduced to about 1000° C. at about the top of zone 2;

(c) introducing a reducing gas at a temperature of about 1000° C. through tuyeres near the mantel at the bottom of zone 3, said gas containing CO, $H_2$ and $N_2$ and being substantially free of $CO_2$, $H_2O$ and sulfur, said gas providing at least about one-half of the CO and $H_2$ that passes upwardly into zone 3 to reduce the iron oxide to iron;

(d) controlling the introduction of said reducing gas to maintain a $H_2$:CO ratio at least about 1:6 in said upwardly moving gas near the bottom of zone 3 and to provide sufficient CO to substantially avoid solution loss of coke in zone 3;

(e) withdrawing molten iron and molten slag from near the bottom of the furnace; and

(f) withdrawing gas from the top of said furnace having a heat content of from about 100 to about 155 Btu per cubic foot.

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**4,381,939**

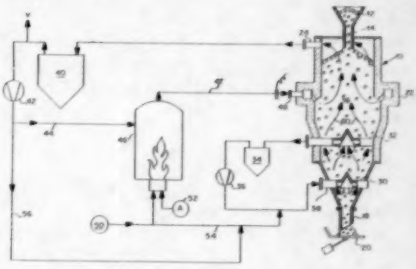
## METHOD FOR SELECTIVE REDUCTION OF METALLIC OXIDES

**William A. Ahrendt; David C. Meissner; Charles W. Sanzenbacher, all of Charlotte, N.C., and John C. Scarlett, Toledo, Ohio, assignors to Midrex Corporation, Charlotte, N.C.**

**Filed Jan. 29, 1981, Ser. No. 229,611**
**Int. Cl.³ C22B 23/02**
**U.S. Cl. 75—82** **5 Claims**

1. A method for the selective reduction of nickel oxide or the oxides of nickel and cobalt in the presence of iron oxide comprising charging iron oxide and at least one oxide selected from the group comprising nickel oxide and cobalt oxide in agglomerated or lump form to a continuous shaft furnace to form a gravitationally descending burden therein, passing a reducing gas through the burden in counterflow relation to it, removing reacted reducing gas from said shaft furnace, cooling and cleaning said reacted gas, dividing said cooled, cleaned reacted gas into a first stream and a second stream;

burning a fossil fuel in a combustion chamber external to said furnace, mixing said first stream of cooled, cleaned reacted gas with the gases in said combustion chamber to form said reducing gas having a reductant to oxidant ratio adequate to reduce nickel oxide and/or cobalt oxide as desired but insufficient to reduce iron oxide to the metallic state;



introducing said reducing gas into said shaft furnace; and

introducing a cooling gas into a cooling zone in the lower portion of said shaft furnace, removing a substantial portion of said cooling gas from said shaft furnace above the location of cooling gas introduction and below the location of reducing gas introduction, cooling and scrubbing said removed portion of said cooling gas to form a cleaned cooled cooling gas, mixing said cleaned cooled cooling gas with said second stream of cooled cleaned reacted gas and introducing the resulting gas mixture into said cooling zone, thereby causing the unremoved portion of said cooling gas to flow upwardly beyond the elevation of cooling gas removal, to be heated by the burden and to thereafter act as a reducing gas.

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**4,381,940**

## LOW ALLOY HEAT-RESISTING STEEL FOR HIGH TEMPERATURE USE

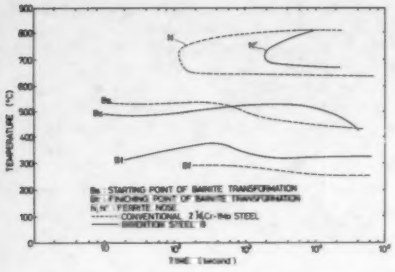
**Juro Watanabe, Tokyo; Keizo Ohnishi; Toru Ishiguro, both of Muroran, and Takatoshi Ogawa, Noboribetsu, all of Japan, assignors to The Japan Steel Works, Ltd., Japan**

**Filed Aug. 29, 1980, Ser. No. 182,830**
**Claims priority, application Japan, Nov. 15, 1979, 54-148218**
**Int. Cl.³ C22C 38/06, 38/22, 38/28, 38/32**
**U.S. Cl. 75—124** **2 Claims**

1. Low alloy, heat-resistant, high temperature steel comprising by weight 0.08–0.15% carbon, up to 0.05% silicon, 0.40–0.60% manganese, up to 0.15% nickel, 2.00–3.00 chromium, 0.80–1.20% molybdenum, 0.15–0.25% vanadium, 0.020–0.030% titanium, and 0.0015–0.0025% boron, balance iron and incidental impurities.

2. Low alloy, heat-resistant, high-temperature steel comprising by weight 0.08–0.15% carbon, up to 0.05% silicon,

0.40–0.60% manganese, up to 0.15% nickel, 2.00–3.00 chromium, 0.80–1.20% molybdenum, 0.15–0.25% vanadium,




0.020–0.030% aluminum, and 0.0015–0.0025% boron, balance iron and incidental impurities.

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**4,381,941**

## METHOD FOR IMPROVING SURFACE DEFECT OF SPECIFIC STEEL RESISTANT TO CONCENTRATED NITRIC ACID

**Naoya Ito, Koganei; Takeshi Yoshida; Masahiro Aoki, both of Joetsu; Masao Okubo, and Masayoshi Miki, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan, Nippon Stainless Steel Co., Tokyo, Japan**

**Filed Mar. 23, 1981, Ser. No. 246,859**
**Claims priority, application Japan, Apr. 2, 1980, 55-43792**
**Int. Cl.³ C22C *33/00***
**U.S. Cl. 75—130.5** **4 Claims**

1. A method for reducing surface defects of specific steel resistant to concentrated nitric acid, wherein the specific steel is either stainless steel comprising carbon in an amount of not more than 0.1% (C≦0.1%),

silicon in an amount from not less than 2.5% to not more than 5.0% (2.5≦Si≦5%),

manganese in an amount of not more than 2% (Mn≦2%),

chromium in an amount from not less than 15% to not more than 20% (15≦Cr≦20%),

nickel in an amount from not less than 10% to not more than 22% (10≦Ni≦22%),

at least one of niobium, tantalum and zirconium in an amount from not less than 10 times the carbon content to not more than 2.5% (C×10≦Nb, Ta and/or Zr≦2.5%),

and the balance being iron and inevitable impurities, or a high-silicon-nickel-chromium steel comprising:

carbon in an amount of not more than 0.03% (C≦0.03%),

silicon in an amount from more than 5% to not more than 7% (5≦Si≦7%),

manganese in an amount of not more than 10% (Mn≦10%),

chromium in an amount from not less than 7% to not more than 16%,

nickel in an amount from not less than 10% to less than 19% (10≦Ni≦19%),

at least one of niobium, tantalum and zirconium in an amount from not less than 4 times the carbon content to not more than 2%,

and the balance being iron and inevitable impurities, characterized by adding titanium in an amount from not less than 0.05% to not more than 0.2% (0.05≦Ti≦0.2%) to melted steel and thereafter removing titanium slag when producing said steel, percentages being by weight.

**4,381,942**

## PROCESS FOR THE PRODUCTION OF TITANIUM-BASED ALLOY MEMBERS BY POWDER METALLURGY

**Pierre Blum, Grenoble, and Jacques Devillard, Saint Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Aug. 22, 1980, Ser. No. 180,503**
**Claims priority, application France, Aug. 27, 1979, 79 21441**
**Int. Cl.³ B22F *1/00, 3/12***
**U.S. Cl. 419—23** **14 Claims**

*1 2*

1. A process for the production of titanium based alloy members, comprising:

(a) preparing a metal powder selected from the group consisting of titanium and titanium alloys having a grain size distribution between 100 and 1000 μm,

(b) depositing on said powder a coating formed from a material that in contact with said titanium powder can form a liquid phase at a temperature $T_1$, which is below the allotropic transformation temperature T of said powder,

(c) introducing the coated powder into a mould, and

(d) hot compressing the powder in the mould under a pressure of 10 to 30 MPa and at a temperature between $T_1$ and T for a time sufficient to obtain complete densification of the powder.

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**4,381,943**

## CHEMICALLY HOMOGENEOUS MICROCRYSTALLINE METAL POWDER FOR COATING SUBSTRATES

**James Dickson, Stirling; Louis F. Nienart, Bloomsbury, and David W. H. Roth, Jr., Convent Station, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Jul. 22, 1981, Ser. No. 285,881**
**Int. Cl.³ B22F *1/00***
**U.S. Cl. 75—2.51** **6 Claims**

1. A boron containing metal powder for deposit onto a substrate to form a boride-free continuous coating which is bonded to the substrate and free from interconnected porosity comprising a chemically homogeneous microcrystalline powder having Ni, Fe, Co or a combination thereof as a base and which contains between about 5 at % and 30 at % B; said powder is in platelet form having an outline formed by fracture and having a particle size distribution such that said powder will pass through an 80 mesh (Tyler) screen and less than half of said powder will pass through a +270 mesh screen.

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**4,381,944**

## SUPERALLOY ARTICLE REPAIR METHOD AND ALLOY POWDER MIXTURE

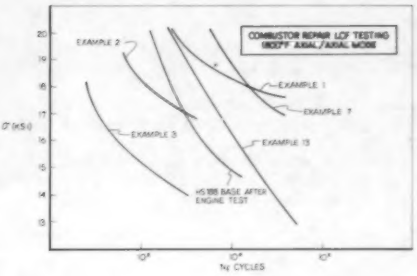
**Murray S. Smith, Jr., Cincinnati; Mark S. Hilboldt, Fairfield, both of Ohio, and Thirmaleshwara A. Bhat, Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio**

**Filed May 28, 1982, Ser. No. 383,078**
**Int. Cl.³ B23P *6/04;* B23K *1/04;* B22F *7/02***
**U.S. Cl. 75—255** **13 Claims**

1. A mixture of a first alloy powder and a second alloy powder;

the first alloy powder characterized as having good strength and environmental resistance and the substantial absence of melting point depressant elements selected from the group consisting of Si and B in amounts greater than, by weight, 1% Si and 0.05% B;

the first alloy powder consisting essentially of, by weight, 0.01–0.65% C, 19–27% Cr, 0.2–16% W, up to 10% Mo, up to 20% Fe, up to 4% Ta, up to 1% Ti, up to 1% Zr, up to 0.5% La, up to 2% Mn, with the balance incidental impurities and at least one element selected from the group consisting of Ni and Co;




the second alloy powder being of a Ni-Cr-Si-B-Co base alloy with a melting temperature lower than that of the first alloy powder and consisting essentially of, by weight, about 8–18% Cr, 2–6% Si, 1–5% B, 10–30% Co, up to about 5% Fe, with the balance Ni and incidental impurities, and further characterized by the substantial absence of C in amounts greater than an impurity level;

the mixture consisting essentially of, by weight, 35–65% of the first alloy powder and 35–65% of the second alloy powder.

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**4,381,945**

## THICK FILM CONDUCTOR COMPOSITIONS

**Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 3, 1981, Ser. No. 289,113**
**Int. Cl.³ C09D 5/24**
**U.S. Cl. 106—1.14** **9 Claims**

1. In a metallization composition for use in the manufacture of printed conductors comprising an admixture of finely divided particles of

30 to 80% by weight noble metal or alloy thereof,

1 to 20% by weight low-melting, low viscosity glass frit and

0.1 to 10% by weight inorganic metal oxide capable of reacting with $Al_2O_3$ to form a spinel structure; the improvement comprising a hydrolyzable

organotitanate alcoholate which is a source of positive titanium ions,

the above-indicated functionality of the components being obtainable by firing the admixture to effect liquid phase sintering of the glass and noble metal.

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**4,381,946**

## INK COMPOSITION FOR INK-JET RECORDING

**Masafumi Uehara, and Mitsuyoshi Itano, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Feb. 24, 1981, Ser. No. 237,605**
**Claims priority, application Japan, Feb. 25, 1980, 55-23016**
**Int. Cl.³ C09D 11/02**
**U.S. Cl. 106—22** **6 Claims**

1. An ink composition for ink-jet recording which is an aqueous solution comprising a water-soluble acid dye, a water soluble direct dye, or mixtures thereof, and a compound selected from the class consisting of a polyhydric alcohol having 1–4 carbon atoms, hexylene glycol, triethylene glycol, di-propylene glycol and 1,2,6-hexane triol, said composition having a viscosity of from 4 to 20 cps, a surface tension of from 40 to 60 dynes/cm and a specific resistance of from $5\times10^3$ to $1\times10^5\Omega$cm.

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**4,381,947**

## SETTABLE ALGINATE COMPOSITIONS

**Michael A. Pellico, Los Angeles, Calif., assignor to Laclede Professional Products, Inc., Brooklyn, N.Y.**

**Continuation-in-part of Ser. No. 220,303, Dec. 29, 1980, abandoned. This application May 17, 1982, Ser. No. 378,917**
**Int. Cl.³ C08L 5/04**
**U.S. Cl. 106—38.5 D** **24 Claims**

1. A two-component system interactable to form an oral, settable, dental composition comprising:

(i) Component A consisting essentially of an alkali metal alginate selected from the group consisting of sodium alginate, potassium alginate and mixtures thereof in an aqueous paste; and

(ii) Component B consisting essentially of a slightly water soluble, divalent metal salt and a reaction rate retarder in a fluid plasticizer paste that is substantially free of unbound water, said Component B being so formulated that a pre-selected quantity thereof contains from about 0.5 to about 1.2 parts by weight of divalent metal salt per 1.0 part by weight of alkali metal alginate in Component A, said reaction rate retarder being present in an amount from about 0.02 to about 0.13 part by weight per 1.0 part by weight of said divalent metal salt, and said fluid plasticizer being present in an amount from about 0.75 to about 2 parts by weight per 1.0 part by weight of said divalent metal salt, wherein:

said divalent metal salt is a member selected from the group consisting of calcium sulfate, ferrous sulfate, zinc sulfate, divalent metal salt of fatty acid and mixtures thereof,

said reaction rate retarder is a member selected from the group consisting of phosphate, pyrophosphate, citrate and silicate salts of sodium, potassium and mixtures thereof, and

said fluid plasticizer is a member selected from the group consisting of glycerol, propylene glycol, polyether glycol, oleyl alcohol, silicone oil, mineral oil, vegetable oil and mixtures thereof.

24. A solid, coherent, dental composition prepared by interacting:

(i) Component A consisting essentially of an alkali metal alginate selected from the group consisting of sodium alginate, potassium alginate and mixtures thereof in an aqueous paste; and

(ii) Component B consisting essentially of a slightly water soluble, divalent metal salt and a reaction rate retarder in a fluid plasticizer paste that is substantially free of bound water, said divalent metal salt being present in an amount from about 0.5 to about 1.2 parts by weight per 1.0 part by weight of alkali metal alginate, said reaction rate retarder being present in an amount from about 0.02 to about 0.13 part by weight per 1.0 part by weight of said divalent metal salt and said fluid plasticizer being present in an amount from about 0.75 to about 2 parts by weight per 1.0 part by weight of said divalent metal salt, wherein:

said divalent metal salt is a member selected from the group consisting of calcium sulfate, ferrous sulphate, zinc sulfate, divalent metal salt of fatty acid and mixtures thereof,

said reaction rate retarder is a member selected from the group consisting of phosphate, pyrophosphate, citrate and silicate salts of sodium, potassium and mixtures thereof, and

said fluid plasticizer is a member selected from the group consisting of glycerol, propylene glycol, polyether glycol, oleyl alcohol, silicone oil, mineral oil, vegetable oil and mixtures thereof.

4,381,948

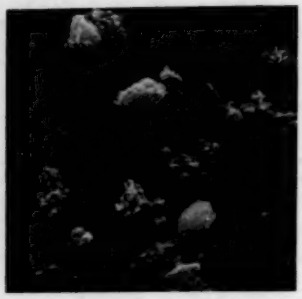
## ANHYDROUS KAOLIN CLAY PIGMENT AND METHOD OF PREPARATION

Anthony D. McConnell, and Robert H. Garner, both of Sandersville, Ga., assignors to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation of Ser. No. 61,008, Jul. 26, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,583

Int. Cl.³ C09C *1/42;* C08H *17/06*

U.S. Cl. 106—288 B 8 Claims



FINAL MAGNIFICATION 4,400X

1. An anhydrous white kaolin clay pigment having high light scattering when incorporated as a filler in paper, said pigment consisting of porous aggregates formed from sub-micron sized kaolin clay platelets obtained by classification of a dispersed kaolin clay to a 100% less than one micron ESD fraction, said aggregates having an average specific gravity in the range of 0.5 to 0.6 and a mean internal pore size of less than 0.55 microns; the size distribution of said aggregates being such that not more than 5% by weight thereof are greater than 10 microns ESD, at least 75% are of less than 2 microns ESD, and not more than 15% by weight are of less than 1 micron ESD; said pigment having a Valley abrasion value below 30 mg, and a GE brightness of at least 93.

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4,381,949

## RESORCINOL-FILLER PREPARATION, PROCESS FOR THE PRODUCTION AND USE OF THE SAME

Gerhard Kühner, Hanau; Siegfried Wolff, Bornheim-Merten, and Lothar Rothbühr, Hürth-Hermülheim, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,475

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1980, 3003934

Int. Cl.³ C09C *1/44*

U.S. Cl. 106—307 17 Claims

1. A resorcinol-filler composition consisting essentially of homogeneously distributed resorcinol and at least one carbon black, the amount of carbon black being 95 to 30% and the amount of resorcinol being 5 to 70%.

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4,381,950

## METHOD FOR REMOVING IRON SULFIDE SCALE FROM METAL SURFACES

Michael B. Lawson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 266,266, May 22, 1981, Pat. No. 4,351,673. This application Aug. 5, 1982, Ser. No. 405,808

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ C23G *1/08*

U.S. Cl. 134—3 16 Claims

1. A process for reducing hydrogen sulfide gas evolution during dissolution of ferrous sulfide with an aqueous acidic solution comprising contacting said ferrous sulfide with an aqueous acidic solution capable of dissolving said ferrous sulfide containing an additive in an amount sufficient to reduce the evolution of said hydrogen sulfide gas during dissolution of said ferrous sulfide, said additive comprising at least one member selected from the group consisting of maleic acid, maleic anhydride, and the alkali metal and ammonium salts of maleic acid.

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4,381,951

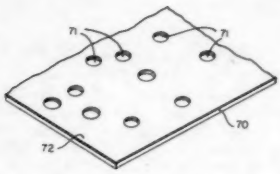
## METHOD OF REMOVING CONTAMINANTS FROM A SURFACE

William J. Baron, Franklin Township, Somerset County; John T. Kenney, Lawrence Township, Mercer County, and Wesley P. Townsend, Princeton Township, Mercer County, all of N.J., assignors to Western Electric Co. Inc., New York, N.Y.

Division of Ser. No. 872,194, Jan. 25, 1978, Pat. No. 4,322,457. This application Jan. 22, 1982, Ser. No. 341,723

Int. Cl.³ B08B *30/00*

U.S. Cl. 134—26 2 Claims




1. A method of removing contaminants from a surface wherein the contaminants have a surface energy of from 15 to 60 dynes per centimeter at 25° C., which comprises:

treating the surface with a material having a first surface energy to combine said material with the contaminants to form a surface having a coat comprising said combined material and contaminants; and

treating said coated surface with a sol having a second surface energy which is greater than said first surface energy to sequentially form a layer of the colloidal species of said sol on said coat, allowing sufficient time to cause migration of said combined material and contaminants from said coat through said layer to the top thereof to form a top layer of said combined material and contaminants.

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4,381,952

## METHOD FOR FABRICATING A LOW LOSS VARACTOR DIODE

Arye Rosen, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 11, 1981, Ser. No. 262,621

Int. Cl.³ H01L *21/263, 21/203, 21/22*

U.S. Cl. 148—1.5 10 Claims

1. A method for fabricating a low loss varactor diode, comprising the steps of:

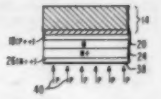
providing a high conductivity first conductivity type semiconductor substrate;

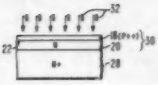
epitaxially forming a low conductivity first conductivity type semiconductor layer on said substrate;

implanting conductivity modifiers of second conductivity type into said epitaxial layer so as to form a very high

conductivity layer at the surface thereof, said implanted layer forming a PN junction with said epitaxial layer;

thinning the substrate so as to form a thinned surface; and





implanting conductivity modifiers of first conductivity type into the thinned surface so as to form a very high conductivity layer at said surface.

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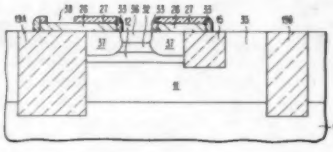
## 4,381,953
## POLYSILICON-BASE SELF-ALIGNED BIPOLAR TRANSISTOR PROCESS

**Allen P. Ho, Poughkeepsie, N.Y., and Cheng T. Horng, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 133,155, Mar. 24, 1980. This application Aug. 17, 1981, Ser. No. 293,771**

**Int. Cl.³ H01L *21/263, 21/22***

**U.S. Cl. 148—1.5** **1 Claim**



1. In a process for fabricating an improved bipolar transistor in a silicon substrate of a first conductivity type, said substrate having a planar surface, a subcollector region of a second conductivity type formed in said substrate, an epitaxial layer of said second conductivity type formed on said planar surface of said substrate, and first, second and third spaced apart recessed oxide isolation regions extending through said epitaxial layer into said substrate, said process including the following steps in the order recited:

(a) utilizing photolithography provide a mask (**23**, FIG. **11**) having a window (**24**) on the exposed surface of said substrate, said window extending from said second recessed oxide isolation region to said third recessed oxide isolation region;

(b) ion implant ions of said second conductivity type into the portion of said epitaxial layer exposed by the window (**24**) inthe mask (**23**) to provide a collector reach through region (**25**, FIG. **11**);

(c) remove the mask (**23**);

(d) chemically vapor deposit a layer (**26**, FIG. **12**) of polycrystalline silicon on the exposed surface of said substrate, said polysilicon layer being doped in-situ with impurities of said first conductivity type said polysilicon layer (**26**) having a thickness of approximately 3000Å and an impurity concentration in the order of $10^{20}$ atoms per cubic centimeter;

(e) chemically vapor deposit a layer (**27**, FIG. **12**) of silicon dioxide on said polysilicon layer (**26**) said chemically vapor deposited silicon dioxide layer (**27**) having a thickness of approximately 3000Å;

(f) utilizing photolithography provide a mask (**28**, FIG. **12**) having first and second windows (**29**) on the exposed surface of the substrate, said first window exposing a portion of said silicon dioxide layer (**27**) spaced between said first and second spaced apart recessed oxide regions, said second window exposing a portion of said layer (**27**) over said collector reach-through region (**25**);

(g) utilizing reactive ion etch techniques remove portions of said silicon dioxide layer (**27**) and the underlying portions of said polysilicon layer (**26**) exposed by said windows (**29**) of mask (**28**) to the polysilicon oxide interface (**30**, FIG. **13**);

(h) thermally grow a thin screen oxide (**31**, FIG. **14**) on the exposed surface of the substrate said thin screen oxide (**31**) having a thickness of approximately 300Å;

(i) ion implant said exposed surface of the substrate with ions of said first conductivity type to form an intrinsic base region (**32**, FIG. **14**);

(j) chemically vapor deposit a relatively thick oxide layer (**33**, FIG. **15**) on the exposed surface of the substrate, said chemically vapor deposited oxide layer having a thickness of approximately 3000Å;

(k) utilizing reactive ion etching remove said relatively thick oxide layer (**33**) except for the sidewall portions of the layer (**33**, FIG. **16**), these sidewall portions which define the emitter opening are not removed since reactive ion etching is highly directional said reactive ion etch of step (k) having an etch rate for oxide which is much faster than the etch rate of silicon;

(l) ion implant said exposed surface of the substrate with ions of said second conductivity type to provide an emitter region (**36**, FIG. **17**);

(m) perform a thermal cycle to anneal and activate the implanted collector reach through region (**35**), the active base region (**32**) and the emitter region (**36**), also simultaneously the first conductivity type polysilicon (**26**, FIG. **17**) will outdiffuse to form the intrinsic base region (**37**).

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## 4,381,954
## METHOD OF INCREASING THE DUCTILITY OF ARTICLES FORMED FROM SUPERPLASTIC ALLOY AND ARTICLE

**Giovanni Piatti, Varese, and Giovanni Pellegrini, Caravate, both of Italy, assignors to European Atomic Energy Community (EURATOM) Batiment Jean Monnet, Plateau du Kirchberg, Luxembourg**

**Filed Dec. 3, 1980, Ser. No. 212,587**

**Claims priority, application Luxembourg, Dec. 17, 1979, 82002**

**Int. Cl.³ C22F *1/04***

**U.S. Cl. 148—2** **5 Claims**

1. A method of producing articles formed from a superplastic aluminum base alloy having improved ductility comprising:

melting together in the absence of oxygen a mixture consisting of 5 to 10% by weight calcium and not more than 1% impurities and the remainder aluminum;

subjecting the resulting alloy to mechanical treatment at a temperature of at least 270° C.;

superplastic forming the desired article;

heating the formed article to a temperature of between 400° C. and 600° C. for at least 30 minutes.

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## 4,381,955
## GOLD BASED ELECTRICAL CONTACT MATERIALS, AND METHOD THEREFOR

**Jaydev D. Desai, Clifton Park, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 17, 1981, Ser. No. 255,081**

**Int. Cl.³ C21D *1/56***

**U.S. Cl. 148—20.3** **6 Claims**

1. A method of carburizing by internal carburization a carburizable refractory element in a solid solution with gold comprising the steps of:

enclosing the solid solution and a temperature decomposable carbon material, and

subjecting the solid solution and the carbon bearing material to a predetermined temperature below the melting temperature of the solid solution and higher than the decomposition temperature of the carbon material for a predetermined period of time.

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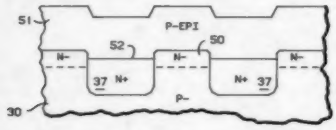
## 4,381,956
## SELF-ALIGNED BURIED CHANNEL FABRICATION PROCESS

**Richard H. Lane, San Jose, Calif., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 6, 1981, Ser. No. 251,615**
**Int. Cl.³ H01L *21/20, 21/22***
**U.S. Cl. 148—175** **7 Claims**




1. A process for providing in a semiconductor wafer a buried region of a second dopant abutting a region of a first dopant, comprising the steps of:

forming on said wafer a first mask pattern resistant to oxidation and a first dopant, and having at least a first opening;

applying said first dopant through said first opening;

forming without further mask alignment a second mask pattern coincident with said first opening having at least a second opening complementary to said first opening;

applying a second dopant through said second opening;

removing said first and second mask patterns; and

forming an epitaxial layer of a predetermined conductivity type and thickness on said semiconductor wafer.

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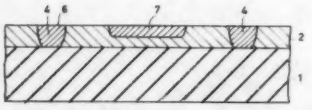
## 4,381,957
## METHOD OF DIFFUSING ALUMINUM

**Hendrik Punter, and Kornelis J. Wagenaar, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 16, 1981, Ser. No. 321,960**
**Claims priority, application Netherlands, Dec. 9, 1980, 8006668**
**Int. Cl.³ H01L *21/225***
**U.S. Cl. 148—188** **13 Claims**




1. A method of manufacturing a semiconductor device in which an aluminium-containing layer, hereinafter referred to as the aluminium source, is locally provided on a semiconductor body of silicon and in a subsequent diffusion treatment aluminium is diffused from the aluminium source into the silicon body and an aluminium-doped region is formed in the silicon body, characterized in that, prior to the diffusion treatment, the aluminium source is divided into parts each having an area which is small as compared with the area of the region to be formed, with a mutual distance which is smaller than double the distance over which the aluminium in the diffusion treatment is diffused laterally into the silicon body, and which parts are so small that their uninterrupted shape is maintained during the diffusion treatment.

## 4,381,958
## TRIAMINOGUANIDINE NITRATE-CONTAINING PROPELLANTS

**William M. Howard, Fort Walton Beach, Fla., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Aug. 7, 1980, Ser. No. 176,211**
**Int. Cl.³ C06B *45/00***
**U.S. Cl. 149—19.8** **10 Claims**

1. In a solid gas generating, rocket or gun propellant composition comprising an intimate mixture of an oxidizing agent selected from triaminoguanidine nitrate (TAGN) and mixtures of TAGN with secondary organic oxidizing agents, a liquid energetic nitrate ester or organic nitramine plasticizer, a nitrocellulose-containing binder component and a stabilizer, the improvement wherein the stabilizer comprises resorcinol, said resorcinol being employed in the liquid energetic plasticizer in an amount so as to at least essentially saturate the liquid energetic plasticizer with resorcinol at 25° C.

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## 4,381,959
## METHOD OF SECURING AN END CLOSURE TO A CONTAINER BODY

**John Walter, Evergreen Park, Ill., assignor to Continental Packaging Company, Inc., Stamford, Conn.**

**Division of Ser. No. 217,616, Dec. 18, 1980, Pat. No. 4,345,047.**
**This application Mar. 15, 1982, Ser. No. 358,067**
**Int. Cl.³ B32B *31/12*; B65B *7/28***
**U.S. Cl. 156—69** **8 Claims**

1. A method of securing a metal end closure having a depending annular wall to an open end of a metal container body which comprises

applying an adhesive to a surface of the annular wall of the end closure and the container body, the adhesive being comprised of a homogeneous dispersion in a volatile organic solvent of a mixture of about 10 to about 70% by weight of a thermoplastic vinyl chloride polymer resin and about 5 to about 30% by weight of a thermosetting epoxy resin normally incompatible with the vinyl chloride polymer resin and an amount of about 20 to about 85% by weight of an acrylonitrile/butadiene/styrene copolymer which amount of copolymer is capable of imparting compatibility between the epoxy resin and the vinyl chloride polymer, the copolymer containing about 10 to about 30% by weight acrylonitrile, about 10 to about 30% by weight butadiene and about 40 to about 70% by weight styrene;

heating the adhesive coated surfaces to volatilize the solvent, soften the thermoplastic resins and harden the epoxy resin;

overlapping the annular wall portion of the end closure on the open end of the container body to form a lap seam assembly;

cooling the assembly whereby the opposed surfaces of the assembly are bonded together by the adhesive solids remaining in the assembly.

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## 4,381,960
## METHOD OF MANUFACTURING A FILAMENT WOUND ARTICLE

**Warren H. Pinter, East Hartland, and David H. Blaney, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

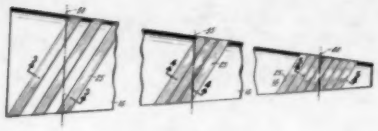
**Filed Dec. 28, 1981, Ser. No. 334,609**
**Int. Cl.³ B65H *81/00*; F03D *1/06***
**U.S. Cl. 156—175** **6 Claims**

1. A method of forming a tapered filament wound article by winding a band of juxtaposed filaments about a form having a longitudinal winding axis, said method being characterized by the steps of:

(a) defining first, second and third longitudinally spaced stations on said form, said second station being located between said first and third stations, the girth of said form at said first station being greater than at said third station.

(b) continuously winding said filament band about said form between said first and third stations until the entire girth of

said form at said second station is covered with a layer of said filamentary material of desired thickness while portions of the girth of said form at said first station remain uncovered with said filamentary materials and



(c) continuously winding said filament band about said form between said first and second stations until the entire girth of said form at said first station is covered with a layer of said filamentary material of desired thickness.

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**4,381,961**

**PRINTING CYLINDER WITH AN OUTSIDE COVERING AND A METHOD AND APPARATUS FOR APPLYING A COVERING ON A CYLINDER SURFACE**

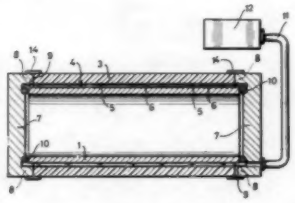
**Hendricus H. van der Veiden, Rn Cuyk, Netherlands, assignor to Stork Screens B.V., Boxmeer, Netherlands**

**Filed May 27, 1981, Ser. No. 267,599**

**Claims priority, application Netherlands, May 28, 1980, 8003073**

**Int. Cl.³ B29C *17/04*; B41F *13/10***

**U.S. Cl. 156—215** **3 Claims**



1. A method for forming a printing cylinder comprising the steps of completely covering the outer surface of a cylinder with a closely fitting layer of a thermoplastic elastomeric composition adapted to be hardened by exposure to light, maintaining a space between said cylinder and said layer by the provision of a pattern of interconnected cavities or channels on said outer surface of said cylinder, enveloping the outer side of the layer with a flexible film of gas-tight material after application of the layer, applying a vacuum to said space for removing any accumulated gases, and thereafter heating said cylinder and said covered layer for 10 to 120 min. at a temperature of 100° to 150° C., while maintaining the vacuum, thereafter removing the application of vacuum and the film, and further heating said cylinder and said covered layer for 10 to 60 min. at a temperature of 100° to 150° C.

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**4,381,962**

**METHOD FOR PRODUCING AN OPEN CELL FOAM FROM A POLYVINYL CHLORIDE RESIN PRODUCED BY SUSPENSION POLYMERIZATION**

**Akira Sato, Tsuchiura, and Tatsuo Waki, Tokyo, both of Japan, assignors to Lonseal Corporation, Tokyo, Japan**

**Filed Nov. 28, 1980, Ser. No. 211,443**

**Claims priority, application Japan, Dec. 25, 1979, 54-169998**

**Int. Cl.³ B29D *27/00***

**U.S. Cl. 156—244.11** **21 Claims**

1. A process for producing an open cell foam comprising the steps of:

(a) forming a calenderable compound comprising polyvinyl chloride resin produced by suspension polymerization, at least one organic stabilizer containing at least one Group I metal and at least one organic stabilizer containing at least one Group II metal, at least one anionic surface active agent, and a heat decomposable blowing agent; and

(b) heating said compound to decompose said blowing agent thereby producing said foam.

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**4,381,963**

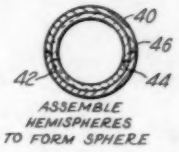
**MICRO FABRICATION MOLDING PROCESS**

**Irving S. Goldstein, Teaneck, N.J.; Franklin D. Kalk, Rochester, N.Y., and Harry W. Deckman, Fanwood, N.J., assignors to The University of Rochester, Rochester, N.Y.**

**Filed Jul. 30, 1980, Ser. No. 173,533**

**Int. Cl.³ B29C *1/14***

**U.S. Cl. 156—245** **18 Claims**




1. The process for fabricating conjugate shells which comprises the steps of making a first mold from a glass microballoon which has conjugate sections about a plane therethrough as a pattern which first mold has the shape of one of said sections, casting at least one master mold in said first mold, molding a plurality of replica molds of soluble material from said master mold, coating at least one layer in each of said replica molds to form shells therein, and dissolving said replica molds to produce a plurality of identical shells, each having the shape of a conjugate section of said microballoon.

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**4,381,964**

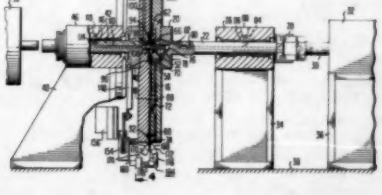
**METHOD AND APPARATUS FOR SEPARATING A STAMPER FROM A MOLD**

**Brian E. Lock, Oakland, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed May 29, 1981, Ser. No. 268,285**

**Int. Cl.³ C25D *1/20*; C25C *7/08***

**U.S. Cl. 156—344** **22 Claims**



1. A method of separating a metal stamper from a mold having an opening through the center thereof comprising the steps of:

bending the edge of the mold around said opening therethrough away from the adjacent edge of the stamper to allow gas to pass between the mold and the stamper

applying a gas under pressure between the stamper and mold

from the edge of the stamper adjacent the opening in the mold, and

applying forces to the outer surfaces of the stamper and mold in opposite directions to hold them apart after being separated by the pressure applied therebetween.

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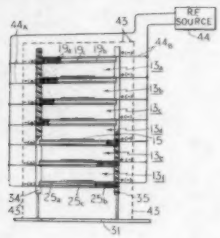
**4,381,965**

## MULTI-PLANAR ELECTRODE PLASMA ETCHING

**Joseph A. Maher, Jr., Hamilton, and Arthur W. Zafiropoulo, Manchester, both of Mass., assignors to Drytek, Inc., Wilmington, Mass.**

**Filed Jan. 6, 1982, Ser. No. 337,372**
**Int. Cl.³ C23C *15/00***
**U.S. Cl. 156—345** **17 Claims**




9. Apparatus for etching workpieces such as semiconductor wafers by exposure to gas plasma, comprising chamber means including means for providing within it gaseous environment from which plasma can be generated under influence of applied electrical potentials, a vertically-stacked multi-electrode assembly for applying said potentials similarly across all of an aligned series of separate plasma-discharge regions each accommodating a workpiece within said chamber means, said assembly including a plurality of substantially horizontal electrode units each having a pair of substantially planar electrodes with substantially the same lateral dimensions and shape and a fill of solid dielectric material of substantially uniform thickness therebetween, said assembly further including a support structure having uprights mounting said electrode units at the edges thereof in insulated vertically-stacked and aligned relation to one another and with the same uniform-height spacing therebetween defining said separate plasma-discharge regions, said thickness of said full of dielectric material being less than the height of said spacing, and upper electrodes of said units being adapted to receive and support workpieces thereon, and means for applying substantially the same radio-frequency excitation at each instant across electrodes of said units which border the top and bottom of each of said regions to thereby generate substantially identical plasma conditions simultaneously in all of said regions.

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**4,381,966**

## PROCESS FOR FABRICATING RECORDING HEADS FOR MAGNETOGRAPHY

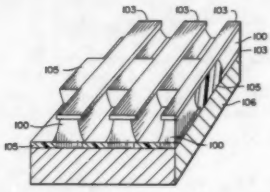
**Houshang Rasekhi, Convent Station, N.J., and Alfred M. Nelson, Redondo Beach, Calif., assignors to Wang Laboratories, Inc., Lowell, Mass.**

**Filed Aug. 31, 1981, Ser. No. 297,610**
**Int. Cl.³ C23F *1/02***
**U.S. Cl. 156—630** **25 Claims**

1. A method of fabricating from a single piece of foil-thickness, conductive first material the recording element structure of a multi-channel magnetic recording head having a linear array of recording elements, which elements are comprised of elongated substantially parallel conductive finger portions terminating in a common return, with each having a minutely thinned-down recording zone, comprising:

(a) temporarily selectively masking both major sides of the first material in registration with one another and depositing a thin layer of conductive etchant-resistant second material onto the areas of a first of said major sides of the first material exposed by said masking and a thin layer of suitable etchant-resistant third material onto the areas of the second of said major sides of the first material exposed by said masking;

(b) etching the first material on the second side thereof such that the first material between the recording elements at the respective recording zones is completely etched through its thickness;




(c) permanently securing the recording element structure at least in the vicinity of the recording zones to a support with an electrically non-conductive adhesive fourth material, said adhesive fourth material filling the etched areas of said first material in the vicinity of the recording zones; and

(d) completing the etching of the first material between the finger portions.

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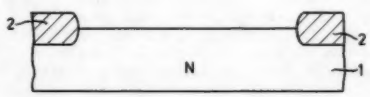
**4,381,967**

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

**Franciscus H. M. Sanders, Eindhoven, Netherlands; Jozef A. M. Sanders, Sunnyvale, Calif., and Jan Dieleman, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 9, 1981, Ser. No. 281,758**
**Claims priority, application Netherlands, Jul. 11, 1980, 8004007**
**Int. Cl.³ H01L *21/306*; C23F *1/02***
**U.S. Cl. 156—643** **7 Claims**




1. In a method of manufacturing a semiconductor device comprising the steps of forming a layer on a substrate, locally covering said layer with an organic lacquer layer, and plasma etching said layer, the improvement comprising forming a plasma of a gas mixture having a composition of an oxygen compound, a halogen compound, and from 1 to 15% by volume of CO.

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**4,381,968**

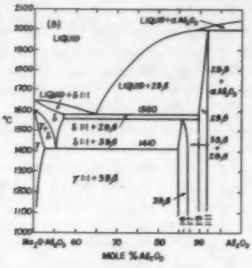
## ETCHED BETA"-ALUMINA CERAMIC ELECTROLYTE

**Raj N. Singh, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 3, 1981, Ser. No. 289,580**
**Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06***
**U.S. Cl. 156—663** **8 Claims**

1. A process for producing a cationically-conductive ceramic electrolyte of symmetric polarization which comprises providing a cationically-conductive ceramic electrolyte of asymmetric polarization, said electrolyte ranging in composition from an alkali metal beta"-alumina phase to a mixture of

alkali metal beta"-alumina phase and up to about 50% by volume of alkali metal beta-alumina phase based on the total volume of the electrolyte, said alkali metal being selected from the group consisting of sodium, potassium, lithium, mixtures thereof and alloys thereof, and etching the surface portion of said ceramic electrolyte with phosphoric acid to produce said cationically-conductive ceramic electrolyte of symmetric polarization, said phosphoric acid having a concentration of $P_2O_5$ which etches said ceramic body, said etching having no significant deleterious effect on said ceramic electrolyte.



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**4,381,969**

## PROCESS FOR THE REGENERATION OF WASTE PAPER

**Jean De Ceuster, Vilvoorde, and Paul Duprez, Brussels, both of Belgium, assignors to Interox, Brussels, Belgium**

**Filed May 22, 1981, Ser. No. 266,597**
**Claims priority, application France, May 22, 1980, 80 11479**
**Int. Cl.³ D21C *5/02***
**U.S. Cl. 162—5** **12 Claims**

1. Process for the regeneration of waste paper containing encapsulated color constituents, which comprises pulping the waste paper in the presence of an aqueous alkaline solution which contains a peroxide compound to form a pulp, and washing the pulp at least once after pulping the waste paper.

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**4,381,970**

## THERMOCATALYTIC REACTOR AND PROCESS FOR PRODUCING SAME

**Laurence B. Craig, 116 Duck Pond Rd., Glen Cove, N.Y. 11542, and Alfred J. Farina, 1939 Anita Ct., Baldwin, N.Y. 11510**

**Filed Feb. 5, 1982, Ser. No. 346,278**
**Int. Cl.³ D21H *5/18*; D21J *7/00***
**U.S. Cl. 162—152** **7 Claims**

1. A process for producing a reactor cylinder for use in a radiant heater, said process comprising the steps of:

preparing a liquid vehicle including;

an alumina dispersion including despersable alumina in an amount between about 1% and about 5% by weight of the entire vehicle; an acid in an amount up to about 0.2% by weight of the entire vehicle; and water in an amount between about 10% and about 30% by weight of the vehicle;

diluting said dispersion by adding water in an amount between about 40% and about 80% by weight of the entire vehicle to form said vehicle;

adding the following material to said vehicle, based on % weight of the entire vehicle, namely, magnesium sulfate in an amount up to about 4% by weight;

colloidal silica in an amount up to about 10% by weight; and

powdered talc in an amount between about 0.0001% and about 0.1% by weight;

admixing with said liquid vehicle a combination of solid alumina and silica fibers in a ratio of grams of fibers to gallons of liquid vehicle of between about 8:1 and about 12:1;

blending said solid fibers and liquid vehicle to form a slurry; and

vacuum molding said slurry about a mandrel to form said reactor cylinder.

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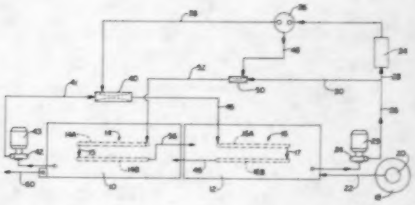
**4,381,971**

## DISTILLATION SYSTEM

**Gerald P. Dietrick, 523 Ridgeview Dr., Florence, Ky. 41042**

**Filed Dec. 16, 1981, Ser. No. 331,258**
**Int. Cl.³ B01D *3/10***
**U.S. Cl. 202—205** **3 Claims**



1. A water distillation system which comprises a storage tank for impure water, a storage tank for distilled water, an impure water jet ejector, impure water pump means for withdrawing impure water from the impure water storage tank, means for directing a portion of the impure water from the impure water pump means to power the impure water jet ejector, a heater, means for directing another portion of the impure water from the impure water pump means to the heater, an evaporator, means for directing heated impure water from the heater to the evaporator, means connecting the bottom of the evaporator to a side arm of the impure water jet ejector, a heat exchanger in the distilled water storage tank, means for directing discharge from the impure water jet ejector through the heat exchanger in the distilled water storage tank to cool the contents of the distilled water storage tank, means for directing discharge from the heat exchanger in the distilled water tank into the impure water storage tank, a distilled water jet ejector, a distilled water pump means for withdrawing distilled water from the distilled water storage tank, means for directing the distilled water from the distilled water pump means to power the distilled water jet ejector, means for withdrawing vapor from the evaporator and for directing the vapor from the evaporator to a side arm of the distilled water jet ejector, a heat exchanger in the impure water storage tank, means for directing discharge from the distilled water jet ejector through the heat exchanger in the impure water storage tank to heat the contents of the impure water storage tank, means for directing discharge from the heat exchanger in the impure water tank into the distilled water storage tank, means for withdrawing distilled water from the distilled water storage tank, and means for supplying impure water to the impure water storage tank.

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**4,381,972**

## COKE-OVEN DOOR

**Wilhelm Stog, Waltrop, Fed. Rep. of Germany, assignor to WSW-Planungs-GmbH, Waltrop, Fed. Rep. of Germany**

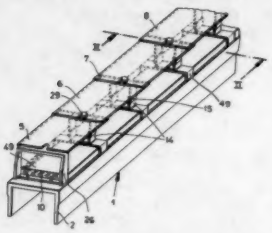
**Filed Feb. 16, 1982, Ser. No. 349,169**
**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105703; Feb. 17, 1981, 3105726**
**Int. Cl.³ C10B *25/06, 29/04***
**U.S. Cl. 202—248** **8 Claims**

1. A door for a coking chamber of a coke-oven battery provided with a pair of doorjambs at the ends of two major parallel chamber walls, comprising:

a frame sealingly engaging said doorjambs;

an upright heat-transmitting metal plate disposed parallel to said frame and separated therefrom by a vertical channel, said plate being divided into a multiplicity of longitudinally adjoining sections;

supporting means mounting said plate on said frame while providing access to said channel from the interior of an associated coking chamber fitted with the door and permitting upward flow of gases entering said channel from



said coking chamber, said support means including a multiplicity of spacers each having a first member fixedly secured to said frame and a second member coupled with at least one of said sections, said members being interengageable in at least two different relative positions within a vertical plane perpendicular to said plate; and

a heat-insulating layer on said frame extending over substantially the full width and height of said frame within said channel.

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**4,381,973**

## PROCESS FOR THE PREPARATION OF PYROCATECHOL AND HYDROQUINONE

**Christoph Jupe, Cologne; Helmut Waldmann, Leverkusen; Jürgen Baumert, Cologne, and Günther Schiimmer, Stommeln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Aug. 14, 1981, Ser. No. 292,855**

**Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032743**

**Int. Cl.³ B01D *3/10***

**U.S. Cl. 203—80** **11 Claims**

1. In a process for the preparation of pyrocatechol and hydroquinone by reaction of phenol with a peroxidic hydroxylating reagent followed by working-up of the mixture, which is present after the reaction, and which contains unreacted phenol, at least one solvent which is lower boiling than phenol, pyrocatechol and hydroquinone, using continuously operated rectification apparatuses, the improvement wherein:

(a) the mixture is continuously fed to a first rectification column at a point between the recitifying section and the stripping section, the rectification column having 3 to 20 separation stages in the stripping section and 5 to 20 separation stages in the rectifying section, this column operated under a pressure between 0.02 and 5 bars, 20 to 95% by weight of the top product condensed as a liquid reflux, is recycled to the column, a top product, which contains practically all constituents of the feed mixture which boil more easily than phenol, is removed, and a bottom product is drawn off, which contains the phenol and practically all of the more highly boiling constituents of the feed mixture; and

(b) the bottom product of the first rectification column is continuously fed to a second rectification column, at a point between the stripping section and the rectifying section, the second rectification column having 3 to 20 separation stages in the stripping section and 3 to 15 separation stages in the rectifying column, this column is operated under a pressure between 0.003 and 5 bars, 20 to 95% by weight of the product collecting at the head is condensed and is recycled as a liquid reflux to the top of the column, a pure phenol product containing less than 0.3% by weight of constituents which are lower boiling than phenol and less than 0.01% by weight of constituents which are higher boiling than phenol is removed as the top product and a bottom product is drawn off, which contains in addition to phenol, pyrocatechol and hydroquinone, and pyrocatechol and hydroquinone are isolated from the bottom product.

11. In a process for the preparation of pyrocatechol and hydroquinone by reaction of phenol with a peroxidic hydroxylating reagent followed by working-up of the mixture, which is present after the reaction, and which contains unreacted phenol, at least one solvent which is lower boiling than phenol, pyrocatechol and hydroquinone, and which is subjected to a further treatment, using for the working-up continuously operated rectification apparatuses, the improvement wherein

(a) the mixture is continuously fed to a first rectification column at a point between the rectifying section and the stripping section, the rectification column having 3 to 20 separation stages in the stripping section and 5 to 20 separation stages in the rectifying section, this column is operated under a pressure between 0.02 and 5 bars, 20 to 95% by weight of the top product condensed as a liquid reflux, is recycled to the column, a top product, which contains practically all constituents of the feed mixture which boil more easily than phenol, is removed, and a bottom product is drawn off, which contains the phenol and practically all of the more highly boiling constituents of the feed mixture; and

(b) the bottom product of the first rectification column is continuously fed to a second rectification column, at a point between the stripping section and the rectifying section, the second rectification column having 3 to 20 separation stages in the stripping section and 3 to 15 separation stages in the rectifying section, this column is operated under a pressure between 0.003 and 5 bars, 20 to 95% by weight of the product collecting at the head is condensed and is recycled as a liquid reflux to the top of the column, a pure phenol product containing less than 0.3% by weight of constituents which are lower boiling than phenol and less than 0.01% by weight of constituent which are higher boiling than phenol is removed as the top product and a bottom product is drawn off, which contains in addition to phenol, pyrocatechol and hydroquinone, and phyrocatechol and hydroquinone are isolated from the bottom product.

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**4,381,974**

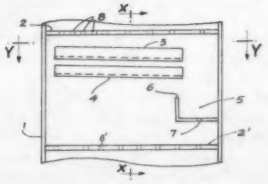
## DISTILLATION COLUMNS

**Ian A. Furzer, Department of Chemical Engineering, University of Sydney, Parramatta Rd., New South Wales 2006, Australia**

**Filed Sep. 8, 1981, Ser. No. 299,986**

**Int. Cl.³ B01D *3/22, 3/24***

**U.S. Cl. 202—158** **9 Claims**



1. A distillation column fitted with downcomerless plates, said column comprising:

at least one pair of adjacent downcomerless plates defining an upper plate and a lower plate, each said plate extending over the entire width of said column and including a

plurality of drain holes through which gas can normally flow up said column and through which liquid can flow down said column during said periodic interruption of said gas flow;

delay means for introducing a time delay into the time taken for liquid in said column to flow from said upper plate to said lower plate;

said delay means comprising receptacle means for receiving substantially all of said liquid passing through said drain holes in said upper plate after said liquid has flowed downward through said drain holes in said upper plate, said receptacle means collecting said liquid and delivering said liquid with a time delay onto said lower plate;

said delay means being arranged within said column in such a manner that gaseous matter rising up said column does not pass through said liquid collected in said receptacle means and whereby said delay means does not substantially hinder the passage of gaseous matter up said column from said lower plate to said upper plate; and means for causing gases to periodically flow up said column so as to carry out a periodic cycling mass transfer operation.

9. A distillation column fitted with downcomerless plates, said column comprising:

(A) at least one pair of adjacent downcomerless plates comprising an upper plate and a lower plate, each said plate extending over the entire width of said column and including a plurality of drain holes through which gas can normally flow up said column and through which liquid can flow down said column during said periodic interruption of said gas flow;

(B) delay means for introducing a time delay into the time taken for liquid in said column to flow from said upper plate to said lower plate, said delay means comprising:

(1) two rows of substantially level channels extending across said column, said channels being spaced from one another and arranged in such manner that said channels of said upper row are located above said spaces separating said channels of the lower row, so that substantially all of said liquid draining through said drain holes in said upper plate is caught in said rows of channels; and

(2) a well provided with a weir level control arrangement, and at least one drain hole, one end of each said channel being closed and the other end being open and disposed above said well so that liquid flows from each said channel into said well, and then drains from said well through said at least one drain hole in said well;

said delay means being arranged within the column in such a manner that gaseous matter rising up said column does not pass through said liquid collected in either said channels or said well whereby said delay means does not substantially hinder the passage of gaseous matter up said column from said lower plate to said upper plate; and means for causing gases to periodically flow up said column so as to carry out a periodic cycling mass transfer operation.

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**4,381,975**

## ALUMINIUM ELECTROPLATING SOLUTION

**Theo E. G. Daenen; Gerardus A. R. van Dijk, and Steven A. Stolk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 18, 1982, Ser. No. 339,933**

**Claims priority, application Netherlands, Feb. 6, 1981, 8100569**

**Int. Cl.³ C25D *3/44***

**U.S. Cl. 204—14 N** **7 Claims**

1. An electrolyte bath for the electrodeposition of ductile aluminum on a substrate, containing lithium hydride and/or lithium aluminum hydride and at least one aluminum halide, dissolved in tetrahydrofuran or halogen and/or methyl derivatives thereof, characterized in that n, defined as

$$n=(X-\tfrac{1}{4}Z)/(Y+\tfrac{1}{4}Z)$$

wherein

X is the total number of moles of dissolved aluminum halide,

Y is the total number of moles of dissolved lithium aluminum hydride,

Z is the total number of moles of lithium hydride,

is greater than 3 and an effective quantity exceeding 0.35 moles/l of alkali metal aluminum chloride is added to the bath.

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**4,381,976**

## PROCESS FOR THE PREPARATION OF TITANIUM BY ELECTROLYSIS

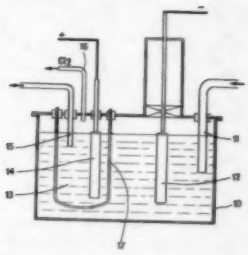
**Marcel Armand, Meylan, France, assignor to Pechiney Ugine Kuhlmann, Paris, France**

**Filed Oct. 20, 1981, Ser. No. 313,228**

**Claims priority, application France, Nov. 27, 1980, 80 25506**

**Int. Cl.³ C25C *3/28***

**U.S. Cl. 204—64 T** **1 Claim**



1. In a continuous electrolytic process for the production of titanium utilizing an electrolysis cell, wherein said electrolysis cell contains titanium in halide form dissolved in an electrolyte containing at least one alkali metal halide or alkaline earth halide, and said electrolysis cell includes a device for introducing into the cathodic region of the cell titanium in halide form having a mean valency of less than 3, the improvement comprising the preparation of this titanium halide by partial reduction of $TiCl_4$ utilizing an alkali metal, alkaline earth metal or alloy thereof and introducing said titanium halide at least intermittently into the cathodic region of said electrolysis cell while removing at least intermittently from the anodic region of the cell which is separated from the cathodic region of the cell by a diaphragm an equivalent amount of molten electrolyte.

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**4,381,977**

## ELECTROCHEMICAL MAINTENANCE OF OPTIMUM CATALYTIC ACTIVITY IN COPPER-CATALYZED NITRILE HYDROLYSIS PROCESSES

**V. Frances Gaylor, Parma; Janice L. Greene, Chagrin Falls; Arthur F. Miller, Lyndhurst, and Marty A. Pichler, Parma, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**Division of Ser. No. 136,191, Apr. 1, 1980, Pat. No. 4,313,803. This application Sep. 21, 1981, Ser. No. 304,211**

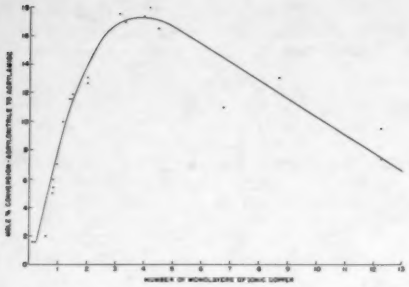
**Int. Cl.³ C25B *1/00, 3/00*; C07C *103/72***

**U.S. Cl. 204—74** **5 Claims**

1. A process for the production of amides from nitriles in water comprising:

contacting an electrolytic solution of nitrile in water in an electrochemical reactor having at least one copper-containing electrode wherein said copper-containing elec-

trode has at least a partial surface coverage of at least an average thickness of 0.75 monolayers of ionic copper,



maintaining the pH of said electrolytic solution below 7, and

applying a direct current to the electrochemical reactor.

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**4,381,978**

**PHOTOELECTROCHEMICAL SYSTEM AND A METHOD OF USING THE SAME**

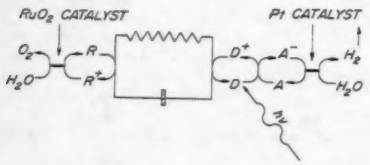
**Michael Gratzel, Corsy; John Kiwi, Preverenges; Kuppuswamy Kalyanasundaram, Chavannes, all of Switzerland, and John Philp, Longlevens, England, assignors to Engelhard Corporation, Iselin, N.J.**

**Continuation of Ser. No. 184,610, Sep. 5, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,966**

**Claims priority, application United Kingdom, Sep. 8, 1979, 7931251; Jul. 8, 1980, 8022341**

**Int. Cl.³ C25B** *3/00, 1/10, 1/24*

**U.S. Cl. 204—75** **22 Claims**




7. A method for the endoergic production of oxidation and reduction products from at least one substrate material which comprises (a) irradiating with visible light an aqueous mixture in a halfcell containing (i) a said substrate material, (ii) a photosensitizer which absorbs visible light, (iii) an electron relay substance, one of elements (ii) or (iii) functioning as an electron donor and the other of which functioning as an electron acceptor, and (iv) an electrode; (b) mediating with a catalyst the oxidation-reduction process of said substrate material in said illuminated halfcell; (c) maintaining a darkened halfcell which contains a said substrate material which may be the same as or different from that in said illuminated halfcell, and an electrode; (d) mediating with a catalyst the oxidation-reduction process of said last mentioned substrate material in said darkened halfcell; (e) simultaneously transporting electrons and ions between said illuminated halfcell and said darkened halfcell via an electrically conductive element joining said electrodes and an ion conducting junction, respectively, and (f) recovering the oxidation and reduction products.

**4,381,979**

**ELECTROLYSIS CELL AND METHOD OF GENERATING HALOGEN**

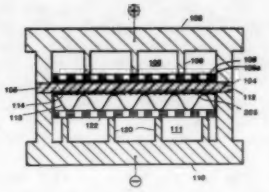
**Oronzio De Nora, Piazza della Repubblica 19; Antonio Nidola, Via Farneti 5, and Gian N. Martelli, Via Padova 194, all of Milan, Italy**

**Continuation-in-part of Ser. No. 212,172, Dec. 2, 1980, which is a continuation-in-part of Ser. No. 102,629, filed Dec. 11, 1979, Pat. No. 4,340,452. This application May 29, 1981, Ser. No. 268,431**

**Claims priority, application Italy, Oct. 21, 1980, 25483 A/80**

**Int. Cl.³ C25B** *1/34*

**U.S. Cl. 204—98** **22 Claims**



1. A method of generating halogen which comprises electrolyzing an aqueous halide in an electrolytic cell having a pair of opposed electrodes separated by an ion exchange separator at least one of said electrodes having a first electroconductive electrolyte resistant metal screen of relatively low overvoltage and a second electroconductive metal screen of higher overvoltage between the separator and the first metal screen.

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**4,381,980**

**PROCESS FOR THE MANUFACTURE OF SULFOBETAINES**

**Detlef Ballschuh; Roland Ohme; Jochen Rusche; Horst Seibt; Kristina Geneis, and Kurt Schaurich, all of Berlin, German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.**

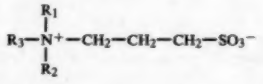
**Filed Jul. 8, 1981, Ser. No. 281,457**

**Claims priority, application German Democratic Rep., Jul. 11, 1980, 222562**

**Int. Cl.³ B01J** *19/08, 19/12;* **C07D** *295/00*

**U.S. Cl. 204—158 R** **26 Claims**

1. A process for preparing a sulfobetaine of formula I



I

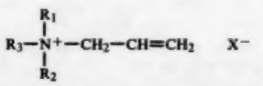
wherein

$R_1$ is hydrogen, straight-chained or branched alkyl groups of 1 to 22 carbon atoms, hydroxyalkyl, or aralkyl,

$R_2$ is an alkyl group as indicated for $R_1$, provided that $R_1$ and $R_2$ may be the same or different or together form a closed ring, and

$R_3$ is an alkyl group of the formula $CH_3—(CH_2)_n—$ where n=0 to 25 branched alkyl groups, hydroxyalkyl groups, or substituted alkyl groups,

wherein an alkylammonium salt of the general formula IV



IV

wherein $R_1$, $R_2$ and $R_3$ have the same definition as above, and X is fluoride, chloride, bromide, methosulfate or an equivalent sulfate, equivalent sulfite, and equivalent phos-

phate, is reacted with at least one salt of sulfurous acid, in a solution at a pH of 2–9, at a temperature from 0° C. to 100° C., and in the presence of at least one transition metal ion of the first, fifth, seventh, or eighth secondary group of the Periodic Table of the Elements and at least one initiator.

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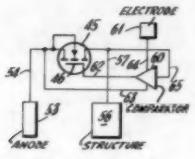
**4,381,981**

## SACRIFICIAL CATHODIC PROTECTION SYSTEM

**Jean P. Maes, Merelbeke, Belgium, assignor to S. A. Texaco Belgium N.V., Brussels, Belgium**

**Filed Dec. 17, 1980, Ser. No. 217,268**
**Int. Cl.³ C23F 13/00**
**U.S. Cl. 204—197** **1 Claim**




1. In a sacrificial anode type of cathodic protection system, said system comprising a cargo-ballast tank of a petroleum product tank ship subject to being contacted periodically by an electrolyte, the improvement comprising

a field effect type metal oxide silicon semi-conductor device having a pair of junctions and a gate,

an anode for contacting said electrolyte to provide said protection,

an electrode for contacting said electrolyte,

a comparator,

first circuit means for connecting one junction of said device to said structure,

second circuit means for connecting the other junction of said device to said anode,

third circuit means for connecting said electrode to said comparator

fourth circuit means for connecting the output of said comparator to said gate,

fifth circuit means for connecting the input of said comparator to one of said junctions of said device, and

sixth circuit means for connecting the other of said junctions of said device to said comparator.

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**4,381,982**

## ROTOGRAVURE CYLINDER PLATING AND DE-PLATING APPARATUS

**Hubert Metzger, Milwaukee, Wis., assignor to Printing Machinery & Electronics, Inc., Milwaukee, Wis.**

**Continuation-in-part of Ser. No. 255,281, Apr. 17, 1981, Pat. No. 4,352,727, which is a continuation-in-part of Ser. No. 211,562, Dec. 1, 1980, Pat. No. 4,331,527. This application Apr. 13, 1982, Ser. No. 367,151**
**Int. Cl.³ C25D 17/00, 17/12**
**U.S. Cl. 204—212** **7 Claims**

1. Apparatus for electrolytic plating and de-plating of rotogravure cylinders, comprising a tank adapted to contain a plating solution and including means for supporting therein a cylinder for rotation about a horizontal axis in one direction,

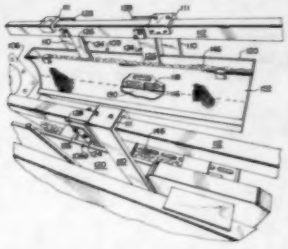
baskets disposed in said tank, one on each side of the cylinder, with inner concavo-convex arcuate perforate walls closely spaced from and concentric with the cylinder and outer walls spaced from the inner walls in the direction away from the cylinder, said baskets being of non-conducting plastic material,

elongate metallic current conductor strips having upper protectively coated portions disposed above the baskets, and lower bare portions extending downwardly along inner sides of the outer basket walls,

means for connecting a source of current to the upper portions of the conductor strips,

nuggets of metal packed in said baskets between the lower portions of said conductor strips and the inner walls of the baskets,

metallic screens disposed between the inner basket walls and



cylinder and in electric connection with the metallic current conductor strips,

a sheet of porous plastic material disposed between the lower portion of the concave side of each of the inner basket walls and the cylinder,

and supply means for plating solution including a supply conduit having jet outlets disposed along a lower portion of the inner wall of at least one of the baksets for injecting plating solution between the porous plastic sheet and said cylinder.

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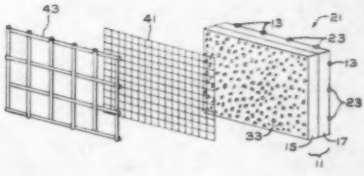
**4,381,983**

## SOLID POLYMER ELECTROLYTE CELL

**Malcolm Korach, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 155,278, Jun. 2, 1980, Pat. No. 4,299,674. This application May 13, 1981, Ser. No. 263,330**
**Int. Cl.³ C25B 9/00, 13/08**
**U.S. Cl. 204—252** **2 Claims**




1. In a solid polymer electrolyte electrolytic cell having a solid polymer electrolyte comprising:

a. a permionic membrane having an anodic portion and a cathodic portion;

b. anodic means in contact with the anodic portion of the permionic membrane; and

c. cathodic means in contact with the cathodic portion of the permionic membrane; the improvement wherein the anodic portion of the permionic membrane has a higher cation selectivity than the cathodic portion of the permionic membrane; the anodic portion of the permionic membrane comprises carboxylate groups and the cathodic portion comprises anion selective, basic material chosen from the group consisting of,

$R_f$—$NH_2$,

$R_f$—$NHR_1$,

$R_f$—$NR_1R_2$,

$R_f$—$NR_1R_2R_3$,

and the anodic portion comprises $R_P—COO^-$, where $R_P$ is the polymer chain, and $R_1$, $R_2$, and $R_3$ are chosen from the group consisting of hydrogen, nitrogen, alkyl groups, and aryl groups.

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**4,381,984**

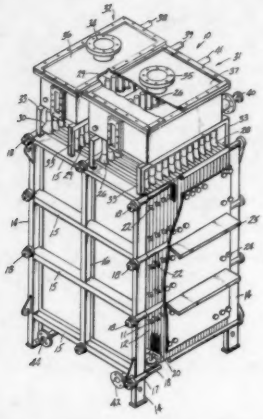
## ELECTRODE FRAME

**Morton S. Kircher, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.**

**Continuation-in-part of Ser. No. 157,918, Jun. 6, 1980, Pat. No. 4,313,812, which is a continuation-in-part of Ser. No. 128,684, Mar. 10, 1980, abandoned, and Ser. No. 143,969, Apr. 25, 1980, Pat. No. 4,312,737. This application Apr. 2, 1981, Ser. No. 250,506**

**Int. Cl.³ C25B *9/00, 15/08, 11/03***

**U.S. Cl. 204—258** **18 Claims**



1. In a frame for an electrode utilized in a filter press membrane cell and adapted to have opposing electrode surfaces connected thereto and which are adjacent membranes in an assembled filter press membrane cell comprising:

a. a base portion of predetermined thickness and predetermined length having a first side and a second side;

b. a first leg connected to the first side of the base portion and adapted to have foraminous electrode surface means fixedly fastened thereto;

c. a second leg connected to the second side of the base portion, the second leg combining with the base portion and the first leg to be of an assembled predetermined width and adapted to have foraminous electrode surface means fixedly fastened thereto; and

d. reinforcing means fixedly fastened to the base portion to strengthen the frame against compressive force applied against the first and second legs adjacent the base portion and being of a second width greater than the assembled predetermined width.

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**4,381,985**

## MEMBRANE CONSTRUCTION

**George A. Ryder, Jr., Seminole, Fla., assignor to Innova, Inc., Clearwater, Fla.**

**Filed Mar. 9, 1981, Ser. No. 242,312**

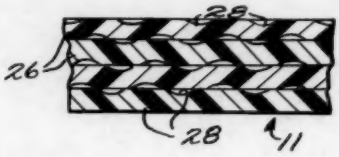
**Int. Cl.³ C25B *13/02, 13/04***

**U.S. Cl. 204—296** **24 Claims**

1. A membrane assembly for electrochemical processes, comprising:

a membrane defined by a stack of corrosion-resistant, water impervious, electrically non-conductive, relatively soft, normally non-capillary material film layers, the stack having a length, width, and height;

surface manifestations formed on said film layers defining capillaries extending continuously from one side of said




stack, across the width thereof, to the other side of said stack; and

means for compressing said layers together to control the water permeability of the membrane.

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**4,381,986**

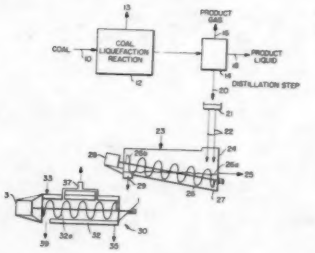
## COOLING AND SOLIDIFICATION OF HEAVY HYDROCARBON LIQUID STREAMS

**Salvatore J. Antieri, Trenton, N.J., and Alfred G. Comolli, Yardley, Pa., assignors to Hydrocarbon Research, Inc., Lawrenceville, NJ**

**Filed Jul. 27, 1981, Ser. No. 286,930**

**Int. Cl.³ C10C *3/16***

**U.S. Cl. 208—8 R** **7 Claims**




1. A process for cooling and solidifying heavy hydrocarbon liquid materials to provide discrete solid particles, comprising:

(a) introducing a stream of the hydrocarbon material at a temperature within the range of 350°–650° F. from a coal liquefaction process into a liquid bath maintained within the range of 50–150° F. and cooling said material in the bath to below its solidification temperature to form an elongated solid extrudate;

(b) passing the solidified material through the liquid bath for further cooling and mechanical breaking to form discrete particles therein; and

(c) withdrawing the hydrocarbon material particles from the cooling liquid bath.

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**4,381,987**

## HYDROPROCESSING CARBONACEOUS FEEDSTOCKS CONTAINING ASPHALTENES

**Christopher W. Kuehler, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Jun. 29, 1981, Ser. No. 278,796**

**Int. Cl.³ C10G *1/06***

**U.S. Cl. 208—10** **18 Claims**

1. A process for avoiding catalyst bed plugging during the liquefaction of coal comprising the steps of:

(a) passing a slurry comprising a hydrocarbonaceous liquid and particulate coal or coal-derived particles with hydrogen upwardly through a catalytic reaction zone in the

presence of a packed bed containing a solid hydroprocessing catalyst under hydroprocessing conditions to produce a hydrocarbonaceous liquid effluent containing insoluble solids; and

(b) controlling the severity of the hydroprocessing conditions in said catalytic reaction zone to maintain the aliphatic hydrogen concentration of said hydrocarbonaceous liquid effluent sufficiently low to prevent substantial precipitation of n-heptane insoluble asphaltenes within said catalytic reaction zone.

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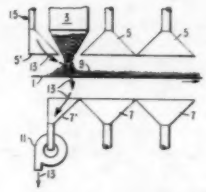
**4,381,988**

## FINE PARTICULATE REMOVAL FROM OIL SHALE ON A TRAVELLING GRATE RETORT

**Daniel W. Kestner, Jr., Corsopolis, Pa., and Frank Forbes, Lakewood, Colo., assignors to Dravo Corporation, Pittsburgh, Pa.**

**Filed Jul. 20, 1981, Ser. No. 285,060**
**Int. Cl.³ C10G *1/00*; C10B *49/06, 53/06***
**U.S. Cl. 208—11 R** **7 Claims**



1. A process for the removal of fines from a bed of oil bearing shale on a travelling grate retort which includes a feed zone in which said shale is charged onto said grate to form said bed and a plurality of shale processing zones defined by hoods and windboxes disposed above and below the grate and through which said bed is carried by said travelling grate, said removal process being effected prior to the retorting of oil from said oil bearing shale in one of said processing zones by passing hot retorting gases through said bed to vaporize and carry off for condensation, the oil in the shale, said process comprising the steps of:

passing a flow of non-shale oil bearing fluid into said oil bearing shale at a temperature below retorting temperature to entrain in said flow substantially all of the fines in said bed; and

evacuating said flow of fluid with said entrained fines from said bed while maintaining said flow separate from said hot retort gases whereby the amount of fines in the retorted shale oil is significantly decreased.

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**4,381,989**

## METHOD OF AND APPARATUS FOR THE MIXING AND PROCESSING OF FRAGILE MATERIAL AND FRAGMENTED SOLIDS

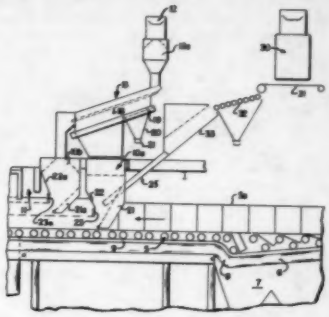
**Frank Forbes, Lakewood, Colo., assignor to Dravo Corporation, Pittsburgh, Pa.**

**Filed Nov. 19, 1981, Ser. No. 322,771**
**Int. Cl.³ C10B *53/06, 37/00***
**U.S. Cl. 208—11 R** **5 Claims**

1. The method of heat processing hard solid fragments and fragile agglomerates on a travelling grate on which they both repose during processing which comprises:

(a) accumulating and continuously feeding the hard fragments into a bin and continuously discharging them from the bin in which they are accmulated onto a travelling grate through a choke-feed forming the bottom of the bin;

(b) feeding fragile agglomerates into a bin and continuously discharging the fragile agglomerates through a plurality of separate conduits, each having a discharge terminal in spaced relation to one another below the surface of the accumulated mass of fragments in the bin but at a level above the level of discharge of the fragments from the bin onto the travelling grate to effect the gradual separation and scattering of the agglomerates through the fragments before they are on the grate but where gradual relative



shifting motion of the fragments with respect to one another as they move downward toward the grate provides for the easy diffusion of the agglomerates through the fragments before the mixture comes to rest on the travelling grate.

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**4,381,990**

## PROCESS FOR PRODUCING MESOCARBON MICROBEADS OF UNIFORM PARTICLE-SIZE DISTRIBUTION

**Kosaku Noguchi, Tokyo; Honami Tanaka, Izumi; Yukimasa Kumura, Izumi; Eiji Kitajima, Izumi; Noriyuki Tsuchiya, Izumi, and Tomonori Sunada, Ootsu, all of Japan, assignors to Kon Oil Company, Limited, Tokyo, Japan**

**Filed Oct. 30, 1981, Ser. No. 316,904**
**Claims priority, application Japan, Nov. 5, 1980, 55-154653**
**Int. Cl.³ C10C *3/08, 1/00, 3/00*; C10B *57/14***
**U.S. Cl. 208—39** **6 Claims**

1. A process for producing mesocarbon microbeads of narrow particle-size distribution which comprises: preparing a primary heat-treated pitch containing mesophase microspheres by subjecting a heavy oil to a primary heat treatment; once cooling the pitch thus prepared to a temperature equal to or lower than the softening point thereof; thereafter subjecting the pitch to a secondary heat treatment at a temperature which is equal to or higher than 300° C. and, moreover, is equal to or lower than the temperature which is 20° C. lower than the primary heat-treatment temperature; cooling the pitch at a cooling rate equal to or lower than 200° C./hour; separating, from the pitch thus heat treated, mesophase microspheres which precipitated in the secondary heat-treatment step; and thereafter obtaining by solvent extraction mesophase microspheres of substantially uniform particle size formed in the residual pitch.

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**4,381,991**

## PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS

**Ralph J. Bertolacini, Naperville; Eugene H. Hirschberg, Park Forest, and Frank S. Modica, Downers Grove, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Division of Ser. No. 29,264, Apr. 11, 1979. This application Jul. 31, 1981, Ser. No. 288,944**
**Int. Cl.³ C10G *11/04, 11/18***
**U.S. Cl. 208—113** **27 Claims**

1. A process for removing sulfur oxides from a gas which comprises:

(a) absorbing sulfur oxides from the gas with a solid absor-

bent which comprises magnesium oxide in association with at least one free or combined rare earth metal selected from the group consisting of lanthanum, cerium, praseodymium, samarium and dysprosium at a temperature in the range from about 100° to about 900° C., wherein said magnesium oxide and rare earth metal or metals are contained within the same particles of said absorbent and the ratio by weight of magnesium oxide to rare earth metal or metals is from about 1.0 to about 1,000; and

(b) removing said absorbed sulfur oxides from the absorbent as a sulfur-containing gas which comprises hydrogen sulfide by contacting said absorbent with a hydrocarbon in the presence of a hydrocarbon cracking catalyst at a temperature in the range from about 375° to about 900° C.

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**4,381,992**

**RECLAIMING USED LUBRICATING OIL**

**William E. Wood, and Donald K. MacQueen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jun. 15, 1981, Ser. No. 273,297**

**Int. Cl.³ C10G** *7/00;* **C10M** *11/00;* **B01D** *3/10, 3/38*

**U.S. Cl. 208—179** **4 Claims**

1. A process for the production of an essentially ash free oil stock from a lubricating oil containing ash-forming components comprising:

(1) contacting said lubricating oil with an aqueous solution of a treating agent comprising an ammonium salt capable of reacting with the ash forming components and rendering them removable under conditions sufficient to disperse said agent in said lubricating oil and react said agent with ash-forming components of said lubricating oil;

(2) removing a major portion of the water from the mixture resulting from combining said aqueous solution and said lubricating oil;

(3) separating solids from the oil resulting from step (2) to obtain a partially purified oil; and

(4) vacuum distilling the partially purified oil with steam dilution in a fractionation column to obtain a plurality of boiling range oil fractions characterized by the fact that said fractionation column is divided into three sections of a total drawoff tray positioned in a lower portion of the column and a partial drawoff tray positioned in an upper portion of the column and a heavy sidedraw fraction is withdrawn from the total drawoff tray, a light sidedraw fraction is withdrawn from the partial drawoff tray, an overhead fraction is withdrawn from the top of the column, further characterized in that a portion of the oils in the overhead fraction is recycled above said partial drawoff tray to provide additional reflux, a first portion of the oils in the heavy sidedraw fraction is recycled below said total drawoff tray, and a second portion of the oils in the heavy sidedraw fraction is recycled above said total drawoff tray in an amount sufficient to assure that the total drawoff tray is not drawn dry.

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**4,381,993**

**PROCESS FOR TREATING HYDROCARBON FEEDSTOCKS WITH CO AND $H_2O$ IN THE PRESENCE OF STEAM STABLE CATALYSTS**

**Thomas D. Nevitt, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Oct. 14, 1981, Ser. No. 311,166**

**Int. Cl.³ C10G** *45/26, 49/18*

**U.S. Cl. 208—217** **16 Claims**

1. A process for treating hydrocarbon feeds to remove contaminants comprising sulfur, nitrogen, oxygen, metals or combinations thereof comprising contacting the feed and a treating gas comprising water and carbon monoxide under reaction conditions in the presence of a catalyst comprising (1) a metallic component having shift and hydrogenating activity, (2) a support component comprising activated alumina and (3) a steam-stabilizing phosphorus component.

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**4,381,994**

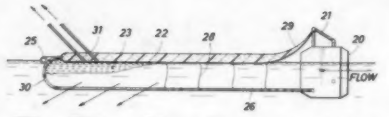
**SPILLED OIL SKIMMER KIT**

**Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 943,100, Sep. 18, 1978, abandoned, which is a continuation of Ser. No. 817,652, Jul. 21, 1977, abandoned, which is a continuation of Ser. No. 737,939, Nov. 2, 1976, abandoned. This application Jan. 18, 1979, Ser. No. 4,417**

**Int. Cl.³ B01D** *2/00*

**U.S. Cl. 210—120** **13 Claims**




1. Apparatus for removing oil from the surface of a turbulent body of water comprising, a chamber for receiving water and oil thereinto during relative movement between the apparatus and the body of water, the chamber being formed by (a) an open, self-floated front, (b) a substantially flat and oil impermeable top, which contacts the body of water and is sufficiently flexible to conform to long waves, (c) a substantially flat and water impermeable flexible bottom ahead of a discharge opening, which bottom intercepts and baffles orbital water motion of incoming shorter waves, (d) sides connecting the bottom and top and extending rearwardly at least no greater angle than would constrict water flow within the chamber and thus focus and reflect incoming waves, (e) ties connecting the top and bottom and giving some stiffness to the top which forms a baffle to suppress wave chop within the chamber, (f) the discharge opening being in the rear of the chamber, which opening directs the exiting flow of water downward and rearwardly, and (g) means for withdrawing oil from the top of the rear of the chamber thus formed.

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**4,381,995**

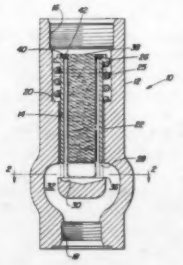
**IN-LINE FILTER AND FLOW CONTROL VALVE**

**Derek M. Eagles, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Sep. 11, 1981, Ser. No. 301,164**

**Int. Cl.³ B01D** *35/02*

**U.S. Cl. 210—137** **4 Claims**



1. An in-line filter assembly comprising: a filter housing defining a valve bore having an inlet at one end, an outlet at another end and an intermediate section between said one and another ends; a tubular valve element reciprocably mounted in the reduced diameter section of the bore; a filter element

mounted in the valve element for intercepting all of the flow occurring between the inlet and the outlet; said filter housing defining a valve seat located between said outlet and said valve element; said valve element having a downstream end adapted for movement toward said valve seat for controlling the flow of fluid from the inlet to the outlet to at least restrict said flow when a predetermined pressure differential exists across the valve and filter elements; and yieldable biasing means acting between the housing and the valve element in a direction holding the valve element away from said seat.

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**4,381,996**

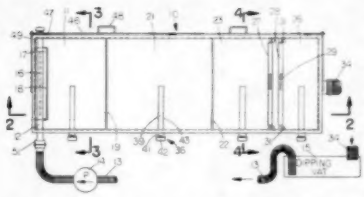
## METHOD AND DEVICE FOR CLEANING LIVESTOCK DIPPING VAT SOLUTION TO BE USED IN CONJUNCTION WITH A DIPPING VAT

**Lane N. Kugler, and H. Dale Kugler, both of Rte. 2, Box 118, Cozad, Dawson County, Nebr. 69130**

**Continuation of Ser. No. 140,046, Apr. 14, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,727**

**Int. Cl.³ B01D** *21/24, 35/28*

**U.S. Cl. 210—195.1** **4 Claims**



1. A device for continuously cleaning livestock dipping vat solution, comprising:

a dipping vat;

a device having one or more means for dividing it into two or more settling compartments, the top of each said dividing means being horizontal and lower in elevation than the lowermost part of the walls of the tank and the preceding such dividing means;

means for transferring contaminated solution from the dipping vat into the tank, including;

an inlet pipe into the compartment formed by the highest dividing means;

a flexible, removable hose connected between the dipping vat and the inlet pipes; and

means for pumping said solution through said inlet pipe from the dipping vat into the tank, whereby the transferring means can be used to return solution from each compartment to the dipping vat when the device is not in its continuous mode;

a gravity pipe connected between the tank and the dipping vat for returning a top-most portion of the solution from the compartment of the tank formed by the lowest dividing means to the dipping vat; and

at least two operably removable screens for trapping animal hair dividing the compartment formed by the lowest dividing means into sections and extending above the uppermost level of the solution in said compartment.

**4,381,997**

## DIFFERENTIAL PRESSURE VALVE FOR A FUEL INJECTION SYSTEM

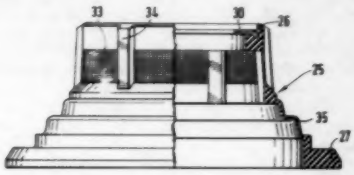
**Klaus-Jürgen Peters, Affalterbach; Peter Stiefel, Ditzingen, and Heinz Ehrentraut, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Division of Ser. No. 123,534, Feb. 22, 1980. This application Nov. 12, 1981, Ser. No. 320,374**

**Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910846**

**Int. Cl.³ B01D** *35/02*

**U.S. Cl. 210—352** **3 Claims**



1. A filter assembly for use in a diaphragm valve comprising an annular filter element having a circumference an upper and lower extremities, an annular resilient member encircling said upper extremity of said filter element, an annular resilient member associated with said lower extremity of said filter element, an annular spring loaded plate having a spring means extending within the annulus of said filter element and associated with said lower annular resilient member and resilient rib-like means arranged in spaced relation about the circumference of said filter element to reinforce the same, said rib-like means being connected to each annuli of said filter element.

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**4,381,998**

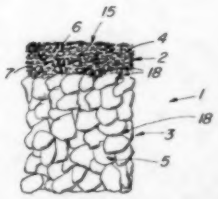
## RIGID FILTER PLATE AND PROCESS FOR MANUFACTURE OF THE SAME

**Robert L. Roberts, St. Charles, Ill., and Felix G. Janssen, Ft. Lauderdale, Fla., assignors to U.S. Environmental Products, Inc., St. Charles, Ill.**

**Filed Aug. 27, 1981, Ser. No. 296,956**

**Int. Cl.³ B01D** *39/20*

**U.S. Cl. 210—503** **39 Claims**



1. An improved rigid sludge dewatering filter plate comprising at least two layers;

the first layer comprising a thin, flat filtering element having an exposed, dense upper surface and a lower surface;

said filtering element consisting essentially of jagged, irregular particles of one or more substances selected from the group consisting of aluminum oxide, corundum, emery, garnet, silicon carbide, boron carbide and manufactured crystalline alumina products, bonded together with an adhesive bonding agent, wherein the particles are of at least two sizes within the range consisting essentially of about 8 grid to about 100 grid and are oriented with aver-

age particle size increasing from the upper surface to the lower surface of the filtering element; and

the second layer being a supporting element comprised of particles larger than the largest particles used in the filtering element, bonded together and to the lower surface of the filtering element with an adhesive bonding agent.

21. A method of manufacturing an improved rigid sludge dewatering filter plate which comprises:

(a) mixing an adhesive bonding agent with inert particles of diameter greater than 8 grid to form a supporting element mixture;

(b) introducing the supporting element mixture into a filter plate mold to a predetermined depth;

(c) tamping the supporting element mixture in the mold;

(d) mixing an adhesive bonding agent with jagged, irregular particles of at least two sizes within the range consisting essentially of 8 grid to 100 grid, wherein the particles are comprised of one or more materials selected from the group consisting of aluminum oxide, corundum, emery, garnet, silicon carbide, boron carbide and manufactured crystalline alumina products, to form a filtering element mixture;

(e) introducing the filtering element mixture into the filter plate mold to a predetermined depth of between about ¼ inch and about 2 inches on top of the tamped supporting element mixture;

(f) smoothing the upper surface of the filtering element mixture with smoothing means;

(g) tamping the filtering element mixture in the mold; and

(h) curing the resulting filter plate.

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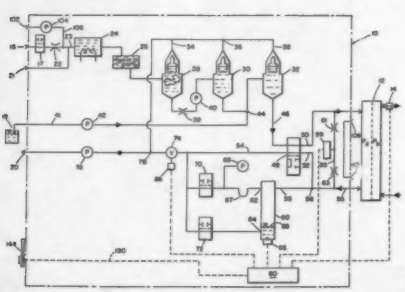
**4,381,999**

## AUTOMATIC ULTRAFILTRATION CONTROL SYSTEM

**Terry D. Boucher, Littleton; Dennis J. Hlavinka, Lakewood; Richard M. Kenshalo, Denver, and Steven H. Johnson, Lakewood, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.**

**Filed Apr. 28, 1981, Ser. No. 258,379**
**Int. Cl.³ B01D *31/00***
**U.S. Cl. 210—637** **9 Claims**



1. A method of automatically achieving a target amount of ultrafiltration in a fluid flow transfer device having a first fluid flowing past one surface of a semipermeable membrane and a second fluid flowing past the other surface by the end of a specific overall time period, said method comprising

supplying said first fluid to said fluid flow transfer device,

removing said first fluid from said fluid flow transfer device,

generating electrical ultrafiltration rate signals indicative of the difference of the flowrate of the first fluid entering said device and the flowrate of the first fluid leaving said device,

generating electrical first fluid pressure signals indicative of the pressure of said first fluid in said device with a first fluid pressure sensor,

generating electrical second fluid pressure signals indicative of the pressure of the other liquid flowing through said device with a second fluid pressure sensor,

adjusting one of said pressures of said fluids in response to electrical pressure adjustment signals,

generating electrical target signals indicative of said target amount of ultrafiltration and said specific time period at control panel means and supplying them to ultrafiltration control means, and

automatically periodically receiving said first and second fluid pressure signals and said ultrafiltration rate signals, computing a coefficient for describing the relationship between the ultrafiltration rate and the difference of pressures of the first and second fluids (the transmembrane pressure), and producing said pressure adjustment signals at said ultrafiltration control means,

said adjustment signals indicating transmembrane pressure corresponding to the desired ultrafiltration rate based upon the most recently calculated value of said coefficient, whereby the actual ultrafiltration rate results in achieving the target fluid loss by the end of said overall time period even if the relationship between the fluid pressures and ultrafiltration rate changes during said specific overall period.

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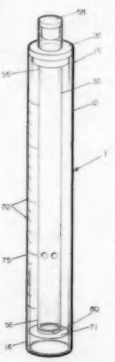
**4,382,000**

## CHROMATOGRAPHY DEVICE AND METHOD OF MAKING CHROMATOGRAPHY TEST

**Sandra M. Wisebaker, Toledo, Ohio, and Paul L. White, Ida, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Feb. 26, 1982, Ser. No. 352,724**
**Int. Cl.³ B01D *15/08***
**U.S. Cl. 210—658** **11 Claims**



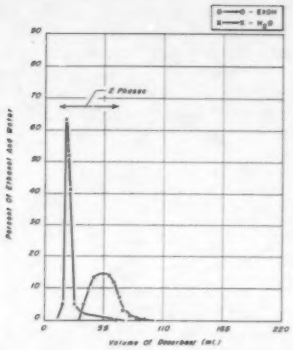
1. A thin layer chromatography device comprising a transparent tube having a first open end adapted for sealing with a stopper, a cylindrical member having a diameter smaller than the tube and of a length at least about equal to that of the tube, the member adapted to fit concentrically within the tube, the outside surface of the member being adapted to receive a thin layer of adsorbent before assembly of the member inside the tube, a fitting at the first end of the tube, the fitting having an annular portion defining an opening adapted to receive and hold the member when the tube and member are assembled together to provide a hermetically sealed device before use, at least one sample positioning opening in the tube whereby, upon use of the device, a sample can be positioned on the outer surface of the member and whereby air can enter the interior of the tube, and there being a second fitting adapted to fit inside the tube, the second fitting having an annular flange defining an opening adapted to receive and hold an end of the member, the member and second fitting being so constructed and arranged as to provide for sliding movement therebetween.

4,382,001

## USE OF ACTIVATED CARBON FOR SEPARATION OF ETHANOL FROM WATER

Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 202,048, Oct. 30, 1980, abandoned. This application Oct. 29, 1981, Ser. No. 316,363
Int. Cl.³ B01D *15/02*
U.S. Cl. 210—674 7 Claims




1. A process for separating ethanol from a feed mixture comprising ethanol and water and for producing a motor fuel blend, which process comprises contacting said mixture at adsorption conditions with an adsorbent comprising activated carbon, selectively adsorbing said ethanol in said adsorbent to the substantial exclusion of water, contacting the adsorbent containing the adsorbed ethanol with a desorbent material comprising a high octane hydrocarbon boiling in the gasoline range to desorb said ethanol from the adsorbent, and removing from said adsorbent and recovering as said motor fuel blend the resultant mixture of ethanol and desorbent material.

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4,382,002

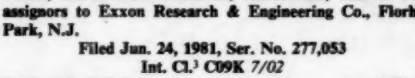
## DRILLING FLUIDS CONTAINING AN ADDITIVE COMPOSITION

Thad O. Walker, Humble, Tex.; Darrell W. Brownawell, Scotch Plains, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 24, 1981, Ser. No. 277,053
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 C 5 Claims

1. An alkaline drilling mud comprising particles of clayey material suspended in sufficient water to render it circulatable and an effective amount of an ester compound formed by the reaction of:

(a) a thio-bis-alkanol of the formula:



wherein R and R′ each independently may be hydrogen, methyl or ethyl, x may be 1–4, y may be 0, 1 or 2, a, b, c, and d, each independently maybe 1–3; with (b) 1 to 2 moles, per mole of the thio-bis-alkanol, of an aliphatic hydrocarbon substituted succinic acid or anhydride wherein the aliphatic hydrocarbon group contains from about 12 to 50 carbon atoms whereby the drilling torque of said mud is reduced.

4,382,003

## BREAKER SYSTEM FOR HYDRAULIC FRACTURING FLUIDS

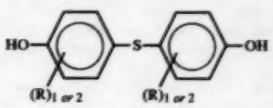
Clare H. Kucera, Tulsa, Okla., and Richard B. Connell, Perryton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1981, Ser. No. 230,490
Int. Cl.³ E21B *43/26*
U.S. Cl. 252—8.55 R 10 Claims

1. A formulated fluid composition having properties making it suitable for use as a hydraulic fracturing fluid, said composition comprising:

(a) a viscosity-increasing amount of an uncrosslinked aqueous polysaccharide solution, and

(b) a 4,4′-thiodiphenol corresponding to the formula



wherein each R is hydrogen or an inert substituent, said 4,4′-thiodiphenol being present in amounts sufficient to break the viscosity of said composition.

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4,382,004

## PREPARATION OF MAGNESIUM ALKYLPHENATES AND THEIR USE AS DETERGENT-DISPERSANT ADDITIVES FOR LUBRICATING OILS

Jean-Pierre Tassara, Villeurbanne, France, assignor to Orogil, Courbevoie, France

Continuation of Ser. No. 123,725, Feb. 22, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,220
Claims priority, application France, Mar. 9, 1979, 79 06060
Int. Cl.³ C10M *1/10*
U.S. Cl. 252—25 15 Claims

1. A method of preparing magnesium alkyl phenates comprising:

(A) preparing a suspension of active magnesium oxide in methanol, said suspension containing up to about 10 percent by weight of active magnesium oxide, referred to the weight of the methanol;

(B) contacting at a temperature between about 0° and 40° C. said suspension with a mixture consisting essentially of:

(a) an alkyl phenol having at least one $C_6$–$C_{60}$ alkyl substituent,

(b) a dilution oil, and

(c) a heavy alcohol of a boiling point of between about 100° and 200° C. that is not a diol,

the ratio of the number of mols of active magnesium oxide to the number of recurrent phenolic OH units being between about 0.25 and 2, the amount of dilution oil being between about 0 and 140 percent by weight, referred to the weight of alkyl phenol, and the molar ratio of heavy alcohol to active magnesium oxide being between about 0 and 4, the said molar ratio being at least 1.2 when the ratio of the number of active magnesium oxide mols to the number of recurrent phenolic OH units is greater than about 0.75;

(C) and carbonating the resultant medium under pressure with carbon dioxide at a temperature between about 0° and 40° C.

4,382,005

## OIL-SOLUBLE NITROGEN CONTAINING SULFONATED POLYMERS USEFUL AS OIL ADDITIVES

Harold N. Miller, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 195,846, Oct. 10, 1980, abandoned. This application Jul. 1, 1981, Ser. No. 279,669

Int. Cl.³ C10M *1/40*; C10L *1/24*

U.S. Cl. 252—32.7 E 47 Claims

1. A composition comprising a major amount of a lubricating or fuel oil and a hydrocarbon soluble V.I. improver—dispersant ionic polymer having a number average molecular weight in the range of 5,000 to 1,000,000 formed by sulfonating an aliphatic $C_2$ to $C_{50}$ olefin polymer with a non-chlorine-containing sulfonating agent to a level of about 1 to 60 milliequivalents of $SO_3H$ groups per 100 grams of sulfonated polymer, said sulfonated polymer being at least partly neutralized with a neutralizing agent selected from the group consisting of ammonia, ammonia salts and amines; wherein when said composition comprises a major amount of said lubricating oil, said composition contains about 0.01 to 10 wt. % of said ionic polymer; and wherein when said composition comprises a major amount of said fuel, said composition contains 0.001 to 0.5 wt. % of said ionic polymer.

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4,382,006

## FRICTION REDUCTION ADDITIVES AND COMPOSITIONS THEREOF

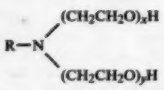
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 91,903, Nov. 6, 1979, abandoned. This application Apr. 20, 1981, Ser. No. 255,914

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—49.6 13 Claims

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor friction reducing proportion of a borated adduct of a compound having the following generalized structure:



where R is a hydrocarbyl group containing from 10 to about 30 carbon atoms, R is selected from the group consisting of alkyl, alkenyl, alkaryl, where x is an integer from 1 to 10; where y is an integer from 1 to 10, and the sum of x and y is at least 2, and where x and y may be the same or different.

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4,382,007

## NOVEL DISPERSANT-VI IMPROVERS AND LUBRICATING OIL CONTAINING SAME

Harry Chafetz, Glenham; Richard F. Love, Fishkill, and James O. Waldbillig, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 230,241, Feb. 2, 1981, abandoned. This application Jun. 23, 1982, Ser. No. 391,089

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A 10 Claims

1. A lubricating composition comprising a major portion of a lubricating oil and an effective dispersing and viscosity improving amount of an additive obtained by oxidizing in an inert solvent or in mineral oil, optionally in the presence of a free radical initiator, an ethylene/propylene copolymer or terpolymer having a molecular weight of about 5,000 to about 500,000, the termonomer thereof being an unsaturated hydrocarbon, until the formation of adequate carbonyl groups due to oxidation and condensing the oxidized portion of the resulting polymer oxidate with the amine function of a nitrogenous dispersant derived from the reaction of a dicarboxylic anhydride with a polyamine.

5. A composition of matter useful as a lubricating oil additive consisting of the reaction product of an oxidate of an ethylene-propylene copolymer or terpolymer with a dispersant derived from a dicarboxylic anhydride reacted with a polyamine, said copolymer or terpolymer having a molecular weight in the range of 5,000 to 500,000 and being selected from ethylene-propylene copolymers or ethylene-propylene terpolymers wherein the termonomer is an unsaturated hydrocarbon.

6. A process comprising: oxidizing in an inert solvent or mineral oil at 140° to 160° C., an ethylene/propylene copolymer or a terpolymer, the termonomer thereof being an unsaturated hydrocarbon and the polymer or terpolymer having a molecular weight of 5,000 to 500,000;

continuing oxidation until the formation of adequate carbonyl groups;

and then condensing the resulting polymer oxidate with the amine function of a nitrogenous dispersant derived from a dicarboxylic anhydride and a polyamine.

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4,382,008

## CORROSION INHIBITORS AND COMPOSITIONS CONTAINING THEM

William Boreland, Hartlepool; John M. Dossor, Redcar, and Geoffrey S. Jaques, Great Ayton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 20, 1981, Ser. No. 236,041

Claims priority, application United Kingdom, Mar. 12, 1980, 8008297

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—75 12 Claims

1. A corrosion inhibitor which comprises: from 2 to 50 parts by weight of a triazole, an alkali metal borate in an amount sufficient to give a boron content of 5 to 60 parts by weight, from 100 to 500 parts by weight of an alkali metal benzoate or toluate, an alkali metal silicate sufficient to provide water soluble silicate and present in an amount of 1.5 to 15 parts by weight expressed as $SiO_2$, and from 15 to 250 parts by weight, calculated as the free acid, of an alkali metal salt of a $C_7$ to $C_{13}$ dibasic organic acid, the corrosion inhibitor giving at a temperature of 25° C. in a 2% solution in water a pH in the range 6.5 to 10.

5. An antifreeze composition which comprises a corrosion inhibitor as claimed in claim 1 and 10,000 parts by weight of the antifreeze component.

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4,382,009

## HYDRAULIC FLUID CONTAINING WATER AND AN α,ω-POLYBUTADIENEDICARBOXYLIC ACID

Rikuzo Maeda, Amagasaki, Japan, assignor to Matsumura Oil Research Corporation, Nishinomiya, Japan

Filed May 19, 1981, Ser. No. 265,078

Claims priority, application Japan, Dec. 3, 1980, 55-171388

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—79 2 Claims

1. A hydraulic fluid comprising an aqueous emulsion or solution of an oil suitable for use as the base for a lubricating oil and selected from the group consisting of a mineral oil and a synthetic oil, and an α,ω-polybutadienedicarboxylic acid having an average molecular weight of about 1,000 to about 1,500, the amount of the α,ω-polybutadienedicarboxylic acid being about 0.1 to about 5% by weight based on the weight of the hydraulic fluid.

**4,382,010**

## DESULFURIZATION OF FLUE GASES WITH COMPLETE SULFITE OXIDATION

**David Lurie, 539 Covington Pl., Wyckoff, N.J. 07481**

**Division of Ser. No. 973,897, Dec. 28, 1978, Pat. No. 4,307,069, which is a continuation-in-part of Ser. No. 688,133, May 20, 1976, Pat. No. 4,134,961, and Ser. No. 904,329, May 9, 1978, Pat. No. 4,202,869. This application Jul. 21, 1980, Ser. No. 170,702**

**Int. Cl.³ C01F *7/10, 7/76;* C01D *5/00***

**U.S. Cl. 252—184** **4 Claims**

1. A mixture consisting essentially of sodium sulfate and aluminum sulfate in about 1.1:1 to 2:1 $Na_2O$:$Al_2O_3$ equivalent molar ratio.

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**4,382,011**

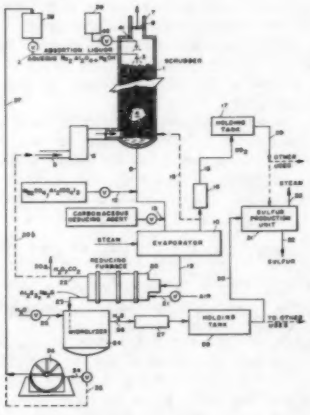
## COMPOSITION OF MATTER USEFUL IN FLUE GAS DESULFURIZATION PROCESS

**David Lurie, 539 Covington Pl., Wyckoff, N.J. 07481**

**Continuation-in-part of Ser. No. 87,213, Oct. 22, 1979, abandoned, which is a division of Ser. No. 904,329, May 9, 1978, Pat. No. 4,202,869, which is a division of Ser. No. 688,133, May 20, 1976, Pat. No. 4,134,961. This application Nov. 18, 1980, Ser. No. 207,916**

**Int. Cl.³ C01F *7/70, 13/00;* C01B *17/16, 17/22***

**U.S. Cl. 252—184** **2 Claims**



1. A fluid molten mixture of aluminum sulfide and sodium sulfide in 1:1 to 1:2 $Al_2O_3$:$Na_2O$ equivalent molar ratio.

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**4,382,012**

## LIQUID CRYSTALLINE DIKETONES

**Rudolf Eidenschink, Dieburg, and Ludwig Pohl, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany**

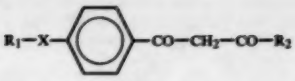
**Division of Ser. No. 148,353, May 9, 1980, Pat. No. 4,297,515. This application Jul. 16, 1981, Ser. No. 283,844**

**Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918775**

**Int. Cl.³ G02F *1/13;* C09K *3/34***

**U.S. Cl. 252—299.1** **7 Claims**

1. A liquid crystal dielectric, comprising at least two liquid crystal components, at least one being a diketone of the formula



wherein $R_1$ is alkyl, perfluoroalkyl or alkoxy, each of 1–18 carbon atoms; $R_2$ is alkyl or perfluoroalkyl, each of 1–12 carbon atoms; and X is 1,4-trans-cyclohexylene, 1,4-phenylene or 4,4'-cyclohexylphenyl.

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**4,382,013**

## ANIONIC SURFACTANT COMPOSITIONS EFFECTIVE IN AQUEOUS SOLUTIONS OF STRONGLY IONIZABLE SALTS

**Thomas M. Kaneko, Trenton; Daniel R. Dutton, and Bongsub Kim, both of Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

**Division of Ser. No. 122,209, Feb. 19, 1980. This application Aug. 3, 1981, Ser. No. 289,492**

**Int. Cl.³ B01F *17/00, 17/30;* E11D *17/00***

**U.S. Cl. 252—354** **7 Claims**

1. A surfactant blend comprising about 50 to 95 percent by weight of at least one polyoxyalkylene glycol ethoxylate ester and about 50 to about 5 percent by weight of at least one other anionic surfactant,

said ester being the reaction product of a polybasic acid or anhydride with a polyoxyalkylene glycol ethoxylate having the formula

$$Y[(A)_x—(C_2H_4O)_m—H]_n$$

wherein A is an alkylene oxide having 4 carbon atoms and selected from the group consisting of oxybutylene, the residue of tetrahydrofuran, and mixtures thereof; Y is an initiator having up to 20 carbon atoms and free of elements other than carbon, hydrogen, oxygen and nitrogen and x is an integer of at least 2, n is an integer such that the molecular weight is about 1000 to about 2500, m is an integer such that the oxyethylene content of the entire compound, mx oxyethylene groups, constitutes about 20 to about 80 percent by weight of the total oxyalkylene content and

said anionic surfactant is at least one anionic alkylaromatic sulphur- or phosphorus-containing ester surfactant having an HLB of at least 15.

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**4,382,014**

## PROCESS FOR PRODUCING A POLYETHER CARBONATE SURFACE ACTIVE MATERIAL

**Shizuyoshi Sakai; Tatsuo Fujinami, both of Hamamatsu; Kunio Kosugi, Iwata; Hiroshi Takemura, Nagoya, and Michiaki Sagesaka, Shimada, all of Japan, assignors to The President of Shizuoka University, Japan**

**Filed Sep. 29, 1980, Ser. No. 191,411**

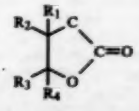
**Claims priority, application Japan, Jan. 29, 1980, 55-8930**

**Int. Cl.³ B01F *17/30***

**U.S. Cl. 252—356** **40 Claims**

1. A process for producing a polyether-carbonate surface active composition comprising

contacting a carbonic acid ester of the formula



in which $R_1$, $R_2$, $R_3$ and $R_4$ which are identical or different are each a hydrogen atom or a methyl group, with an active hydrogen compound which contains a minimum of

4 carbon atoms and at least one active hydrogen containing group selected from aryl and alkyl hydroxy, carboxylic acid and amino groups;

in the presence of an ate-complex catalyst having at least two alkoxy groups of the formula

$$M_i^+[Z(OR)_n]^{i-}$$

in which:

M is an alkali metal,

Z is a metal of Group IIB, IIIA or IVA of the Periodic Table optionally bonded to alkyl or aryl groups

R is an alkyl group

i is 1 or 2

n is 2 to 6

at a temperature of about 60° to 200° C., to telomerize said carbonic acid ester with said active hydrogen compound.

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**4,382,015**

## PASSIVATION OF METAL CONTAMINANTS ON CRACKING CATALYST

**Carmen Castillo, Lyons, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 209,073, Nov. 21, 1980, Pat. No. 4,364,848, which is a continuation-in-part of Ser. No. 132,602, Mar. 21, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 344,106**

**The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.**

**Int. Cl.**[3] **B01J** *29/38, 21/20;* **C10G** *11/18, 11/05*

**U.S. Cl. 252—417** **6 Claims**

1. A process for passivating a metal on fluidized cracking catalyst which has been contaminated with said metal due to the use of said catalyst in a fluidized cracking system, and wherein said catalyst is cycled between a cracking zone, in which said catalyst is contacted at an elevated temperature with a hydrocarbon feedstock containing said metal which deposits on said catalyst, and a regeneration zone, in which carbon is oxidized and thereby removed from said catalyst, said metal being included in the group comprising nickel, vanadium, cobalt or iron, which process comprises contacting said catalyst, prior to the cycling of said catalyst to said cracking zone, with a gas or mixture of gases comprising hydrocarbons selected from the group consisting of hydrocarbons containing one, two and three carbon atoms at passivation reaction conditions, including a temperature of above 1300° F., selected so as to first effect substantially complete reduction of said metal to its metallic state and then deactivation of said metal in its metallic state by carbonization.

4. A process in accordance with claim 1 wherein said contacting of said catalyst with said gaseous mixture occurs in a passivation zone comprising a vessel in the dip leg line between the regeneration vessel and the reactor riser.

6. A process in accordance with claim 1 wherein said gas or mixture of gases contains hydrogen.

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**4,382,016**

## EXTRACTANT FOR THE SELECTIVE REMOVAL OF COBALT(II) FROM AQUEOUS SOLUTIONS

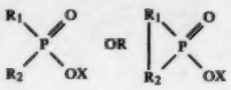
**William A. Rickelton, Niagara Falls; Allan J. Robertson, Thorold, both of Canada, and David R. Burley, Kinnelon, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Division of Ser. No. 263,528, May 14, 1981, Pat. No. 4,348,367, which is a continuation-in-part of Ser. No. 182,296, Aug. 28, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,270**

**Int. Cl.**[3] **C01G** *51/00*

**U.S. Cl. 252—428** **3 Claims**

1. A composition for use in extraction comprising an inert material whereupon an organophosphinic acid of the structure:



is adsorbed entrained or chemically bound wherein $R_1$, $R_2$ are individually substituted or unsubstituted alkyl, cycloalkyl, alkoxyalkyl, alkylcycloalkyl, aryl, alkylaryl, aralkyl or cycloalkylaryl radicals and X is either hydrogen or a salt-forming radical.

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**4,382,017**

## MEANS AND METHOD FOR PROVIDING A NON-FREEZING CATALYST SOLUTION

**Charles A. Robinson, and Barnett J. Robinson, both of 501 Boylston St., Brookline, Mass. 02146**

**Filed Sep. 2, 1980, Ser. No. 182,979**

**Int. Cl.**[3] **B01J** *37/04, 31/28;* **F02B** *75/12;* **C10L** *1/02*

**U.S. Cl. 252—429 R** **2 Claims**

1. A method of preventing unwanted precipitation of a stable aqueous catalyst solution comprising an admixture of a water soluble compound of platinum and chlorine in a catalytic amount, and an antifreeze compound selected from the group consisting of alcohol and glycols and mixtures thereof,

said method comprising adding a chloride selected from the group consisting of hydrochloric acid, lithium chloride, sodium chloride and mixtures thereof to said compound of platinum or to said antifreeze compound prior to admixing said antifreeze compound and said platinum compound, and following said admixing,

adding water to provide approximately 50% water by volume.

2. A method according to claim 1 wherein said compound of platinum and chlorine is $H_2PtCl_6.6H_2O$, said antifreeze compound is ethylene glycol, and wherein said chloride is lithium chloride.

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**4,382,018**

## METHOD FOR MAKING TITANIUM TRICHLORIDE CATALYSTS

**John L. H. Allan, Glen Rock; Birendra K. Patnaik, Parsippany, and Agapios Agapiou, Dumont, all of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.**

**Continuation of Ser. No. 52,652, Jun. 27, 1979, abandoned. This application Dec. 18, 1980, Ser. No. 217,630**

**Int. Cl.**[3] **B01J** *31/02*

**U.S. Cl. 252—429 B** **10 Claims**

1. A catalyst comprising $(1-n)(3TiCl_3AlCl_3)n(3TiCl_3-AlCl_2)$ where

(a) n is a positive number less than or equal to one,

(b) X is selected from the group consisting of oxygen, sulfur, selenium and tellurium,

(c) XR is derived from an electron donor compound $R^1—X—R^2$ wherein $R^1$ is an organic grouping selected from the group consisting of alkyl, cycloalkyl, aryl, substituted derivations thereof and a grouping of the formula



wherein

X is oxygen, sulfur, selenium or tellurium and $R^3$ is alkyl, cycloalkyl, aryl or substituted derivatives thereof, wherein $R^2$ is an organic grouping selected from the group consisting of alkyl, cycloalkyl, aryl, and substituted derivatives thereof, and wherein R is $R^1$ or $R^2$, and

wherein said catalyst is essentially free of any hydrocarbon solvent.

4,382,019

## PURIFIED CATALYST SUPPORT

Carl C. Greco, Garnerville, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 10, 1981, Ser. No. 300,774
Int. Cl.³ C08F 4/64, 4/02
U.S. Cl. 252—429 B 32 Claims

7. In a process for preparing a catalytic system for polymerizing olefins comprising:

(a) a component containing titanium halide obtained by:

(i) activating a support material comprising magnesium chloride with an electron donor to make an activated product, and

(ii) treating the activated product with a titanium halide to form the titanium halide component, and

(b) a component containing an organoaluminum compound, the improvement comprising pretreating the support material comprising magnesium chloride containing about 5 percent or more magnesium metal with an active hydrogen compound in order to transform substantially the elemental magnesium to the magnesium salt of the active hydrogen compound.

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4,382,020

## PROCESS FOR THE PREPARATION OF AN OLEFIN POLYMERIZATION CATALYST

Lambertus J. M. A. van de Leemput, Echt; Godefridus A. H. Nooijen, Helden-Panningen, and Hendrikus W. van der Loo, Munstergeleen, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 7, 1981, Ser. No. 261,738
Claims priority, application Netherlands, May 7, 1980, 8002599
Int. Cl.³ B01J 21/02, 23/02, 23/22, 23/26
U.S. Cl. 252—432 14 Claims

1. An improved process for the preparation of a supported chromium oxide type of catalyst for the polymerization of olefins wherein the reaction product of a chromium-1,3-diketo compound and an organometallic compound of an element from Group II or III of the periodic system is deposited on an inert inorganic supporting material which is thereafter heated in a nonreducing atmosphere at a temperature of between 200° and 1200° C., the improvement comprising:

reacting, in the presence of a solvent which is inert with respect to compounds (1), (2), and (3) hereinafter referenced,

(1) a chromium chelate of a 1,3-diketo compound, and

(2) a vanadium chelate or a vanadyl chelate of a 1,3-diketo compound,

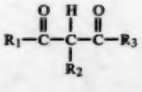
separately or jointly with

(3) an organo-metallic compound of an element from Group II or III of the periodic system in which hydrocarbyl groups with 1–20 carbon atoms are bound, via a carbon atom, to the element;

jointly contacting the resulting solution containing the reaction products of (1) and (2), with (3) with, and depositing said reaction products on, an inert inorganic supporting material; and

heating said supporting material having said reaction products deposited thereon in a non-reducing atmosphere at a temperature of between about 200° and 1200° C.;

wherein said 1,3-diketo compounds of (1) and (2) are the same or different and have the formula



in which formula $R_1$, $R_2$, and $R_3$ are the same or different, $R_1$ and $R_3$ being an alkyl group with 1–10 carbon atoms, and $R_2$ being selected from the group consisting of an alkyl group with 1–10 carbon atoms, and a hydrogen atom.

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4,382,021

## SUPPORTED CATALYST CONTAINING COPPER AND ALKALI METALS

Peter R. Laurer, Ludwigshafen; Gerd Krome, Weisenheim, both of Fed. Rep. of Germany; Luc Cordemans, Kapellen, Belgium; Reinhard Seifert, and Eckehard Danz, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,983
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046407
Int. Cl.³ B01J 27/10
U.S. Cl. 252—441 1 Claim

1. A supported catalyst which is useful for the oxychlorination of ethylene and which comprises: a carrier and deposited therein

(a) copper in the form of copper chloride or copper oxychloride, the amount of copper calculated as metal being from 1.0 to 12% by weight based on the total catalyst, and

(b) alkali metals in the form of potassium chloride, sodium chloride and lithium chloride, the total content of the alkali metals based on the total catalyst being from 0.3 to 9% by weight.

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4,382,022

## SILICA HAVING TITANIUM INCORPORATED THROUGH USE OF PEROXIDE

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1981, Ser. No. 324,886
Int. Cl.³ B01J 21/06, 23/26, 37/00
U.S. Cl. 252—452 20 Claims

1. A method comprising combining a titanium compound, a peroxide, and a mineral acid to form a first solution;

thereafter combining said first solution with a second solution comprising an alkali metal silicate;

allowing gellation to occur;

aging for a time of at least one hour;

washing to remove alkali metal ions; and

removing water to produce a xerogel.

7. A method according to claim 1 wherein said peroxide is hydrogen peroxide, said silicate is sodium silicate, said acid is sulfuric acid and wherein said titanium compound is titanyl sulfate.

10. A method according to claim 1 for producing a catalyst wherein a chromium compound is present in said first solution so as to produce a silica-titanium-chromium tergel.

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4,382,023

## CATALYZED COMBUSTION IN CRACKING CATALYST

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 4, 1981, Ser. No. 231,532
Int. Cl.³ B01J 29/16, 21/12
U.S. Cl. 252—455 Z 3 Claims

1. A composition of matter comprising a mixture of

(a) from 95 to 99.55 weight percent of particles of an acidic cracking catalyst comprising silica and at least one other refractory inorganic oxide; and

(b) from 0.05 to 5 weight percent of particles of an oxidation-promoting catalyst which includes greater than 10 weight percent chromium calculated as elemental metal and from 0.01 to 1 part, by weight, of tin for each part of chromium present, and further the concentration of chromium in the entire composition of matter being between 0.01 and 3.5 weight percent, calculated as elemental metal.

4,382,024

## ELECTRICALLY CONDUCTIVE RUBBER

Peter H. Seaman, and Frederick W. Bloore, both of Wolverhampton, England, assignors to Hotfoil Limited, Wolverhampton, England

Continuation-in-part of Ser. No. 907,415, May 18, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,563
Claims priority, application United Kingdom, May 18, 1977, 20821/77; Canada, May 18, 1978, 303591; France, May 18, 1978, 78 14791
Int. Cl.[3] H01B 1/06
U.S. Cl. 252—511 11 Claims

1. An electrically conductive silicone rubber composition having a positive, non-linear, temperature co-efficient of resistance which is substantially nonconductive at a temperature above a predetermined transition temperature lying in the range 94° C. to 150° C., the composition comprising 5% to 25% based on total material weight of conducting carbon black, from 29% to 62% based on total material weight at least one additive selected from the group consisting of titanium dioxide, silica, zinc oxide, precipitated calcium carbonate, aluminium oxide, barium titanate, copper, aluminium, nickel, iron, having a particle size between 0.005 microns and 100 microns, and having a melting point above the curing temperature of the rubber, and said at least one additive being compatible with said rubber by virtue of said additive particles being wetted by the uncured silicone rubber, the cohesive energy between said silicone rubber and said particles being greater than that between particles, and said additive not affecting the curing of said rubber.

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4,382,025

## AMMONIUMTRIBORATE, AN EFFECTIVE NEW FLAME RETARDANT

Stephen I. Sallay, 2918 Glencairn Dr., Fort Wayne, Ind. 46815

Continuation-in-part of Ser. No. 135,177, Mar. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 927,340, Jul. 24, 1978, Pat. No. 4,196,177. This application Jul. 22, 1981, Ser. No. 286,042
Int. Cl.[3] C09D 5/14; C01B 15/12; C08K 5/05
U.S. Cl. 252—607 21 Claims

1. Crystalline $NH_4.B_3O_5.3\ CH_3\text{-}OH$.

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4,382,026

## PROCESS FOR ENCAPSULATING RADIOACTIVE ORGANIC LIQUIDS IN A RESIN

Stevens S. Drake, and Harold E. Filter, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 962,539, Nov. 20, 1978, abandoned. This application Jan. 30, 1981, Ser. No. 230,139
Int. Cl.[3] G21F 9/12, 9/16
U.S. Cl. 252—628 7 Claims

1. A process for encapsulating low level radioactive liquid water-insoluble organic wastes into a solid form suitable for burial which comprises contacting one part by weight of said waste with less than one part by weight of a particulate, cross-linked, organic liquid-swellable, organic liquid-insoluble polymer to provide discrete, non-coalescent, gelled particles of said polymer and said waste; dispersing 0.1 to 3 parts of said gelled particles essentially uniformly in one part of a curable liquid resin selected from the group consisting of unsaturated polyesters, vinyl ester resins or mixtures thereof and curing said liquid resin to a solid with said gelled particles encased therein.

4,382,027

## PURIFICATION OF HUMAN IMMUNE INTERFERON

Irwin A. Braude, Burke, Va., assignor to Meloy Laborstories, Inc., Springfield, Va.

Filed Aug. 18, 1981, Ser. No. 293,775
Int. Cl.[3] A61K 45/02; C07G 7/00
U.S. Cl. 260—112 R 17 Claims

1. A process for purifying crude human immune interferon which comprises:

(a) contacting a solution of crude interferon with Controlled Pore Glass beads for a period of time sufficient to accomplish equilibrated adsorption of the crude interferon to the beads in the presence of a neutral pH buffer, washing the glass beads having interferon adsorbed thereon with a chemically compatable buffer to remove the unbound contaminant until the optical density of the eluate at 280 nm is about 0, washing the glass beads having interferon adsorbed thereon with a neutral pH buffer solution until the optical density at 280 nm is about 0, eluting the adsorbed immune interferon from the glass beads with an ammonium sulfate solution;

(b) contacting the solution of interferon with an absorbent selected from the group consisting of Concanavalin A-Sepharose, lentil lectin-Sepharose and pea lectin-agarose for the period of time sufficient to accomplish equilibrated adsorption of the interferon to the absorbent in the presence of a neutral pH buffer, washing the absorbent having interferon adsorbed thereon from the soluble fraction with ammonium sulfate until the optical density of the eluate at 280 nm is about 0, washing the absorbent with a neutral pH buffer until the optical density of the eluate at 280 nm is about 0, eluting the adsorbed interferon with a buffer containing a member of the group consisting of alpha-methyl D-mannoside and 1-methyl D-glucoside;

(c) contacting the interferon with a member selected from the group consisting of Heparin-Sepharose or Procian Red-agarose for a period of time sufficient to accomplish equilibrated adsorption of the interferon to the member equilibrated in a neutral pH buffered solution, washing the member containing adsorbed interferon thereon with first a neutral pH buffered solution containing a sugar selected from the group consisting of alpha-methyl D-mannoside and 1-methyl D-glucoside to remove the unbound material until the optical density of the eluate at 280 nm is about 0, washing with a neutral pH buffered solution until the optical density is about 0 to remove the bound material eluting the adsorbed interferon with a second neutral pH buffered solution containing a highly concentrated salt, and;

(d) further purifying by subjecting the elution fraction to gel-filtration treatment equilibrated in a neutral pH buffered solution containing a highly concentrated salt, and eluting whereby the solutes within the elution fractions are separated according to their molecular weights; and collecting the solute fraction containing a near homogeneous interferon preparation.

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4,382,028

## SEPARATION OF PLASMA PROTEINS FROM CELL CULTURE SYSTEMS

G. Edward Paget, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 19, 1982, Ser. No. 399,604
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—112 B 19 Claims

1. A process of separating a plasma protein component from its admixture in a cell culture system comprising adsorbing said plasma protein component therefrom by contact with a water-insoluble, cross-linked polyelectrolyte copolymer of olefinically unsaturated monomer having from 2 to about 4 carbon atoms and $\alpha,\beta$-unsaturated polycarboxylic acid or anhydride having from 4 to about 6 carbon atoms and containing pendant diloweralkylaminoloweralkylimide functional groups.

4,382,029

## PROCESS USEFUL FOR PREPARING 7,8-ACETAMIDO, HYDROXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

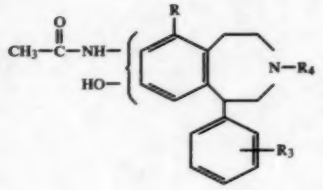
Kenneth G. Holden, Haddonfield; Carl Kaiser, Haddon Heights, both of N.J., and Joseph Weinstock, Phoenixville, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 176,178, Aug. 7, 1980, Pat. No. 4,327,023, which is a division of Ser. No. 117,181, Jan. 31, 1980, Pat. No. 4,284,556. This application Aug. 14, 1981, Ser. No. 292,984

Int. Cl.³ C07D *223/16*

U.S. Cl. 260—239 BB 3 Claims

1. The method of preparing a 7-hydroxy-8-acetamido or a 7-acetamido-8-hydroxy compound of the formula:



I

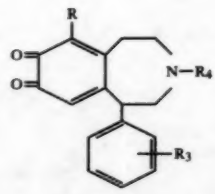
in which:

R is hydrogen, halo or lower alkyl of 1–3 carbons;

$R_3$ is hydrogen, halo, methyl, methoxy, methylthio or hydroxy; and

$R_4$ is methyl, allyl or benzyl, comprising the steps of:

A. reacting a compound of the structure:



II

in which R, $R_3$ and $R_4$ are as defined above, with benzylamine or benzhydrylamine to form a mixture of 7- or 8-hydroxy, benzylimines or of 7- or 8-hydroxy, benzhydrylimines, respectively;

B. reacting either said imine mixture with alcoholic hydrogen chloride to form the 7- or 8-hydroxy, amino compounds;

C. reacting said 7- or 8-hydroxy, amino compounds with acetic anhydride or acetyl chloride to form the 7- or 8-O-acetyl, acetamido compounds;

D. reacting said 7- or 8-O-acetyl, acetamido compounds with sodium hydroxide solution to form the desired 7- or 8-hydroxy, acetamido compounds; and

E. separating by fractional crystallization or chromatography and isolating said 7-hydroxy-8-acetamido or 7-acetamido-8-hydroxy compounds as defined above by known chemical methods.

4,382,030

## 2-ACYLAMINOMETHYL-1,4-BENZODIAZEPINE DERIVATIVES AND THEIR SALTS, PHARMACEUTICAL COMPOSITIONS THEREOF AND PROCESS FOR THEIR PREPARATION

Horst Zeugner, Hanover; Dietmar Roemer, Allschwil, and Hans Liepmann, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

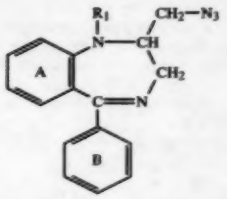
Division of Ser. No. 219,487, Dec. 23, 1980, Pat. No. 4,325,957. This application Jan. 12, 1982, Ser. No. 338,883

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952279

Int. Cl.³ C07D *243/38*

U.S. Cl. 260—239 BD 2 Claims

1. A 2-azidomethyl-5-phenyl-1H-2,3-dihydro-1,4-benzodiazepine derivative of Formula X



wherein $R_1$ represents hydrogen or lower alkyl, and the phenylene group A and the phenyl group B independently from each other each may be unsubstituted or be substituted by 1 to 3 substituents selected from the group consisting of halogen, lower alkylthio, lower alkoxy, lower alkyl, hydroxy, nitro and trifluoromethyl, or be substituted at two adjacent carbon atoms by methylenedioxy or ethylenedioxy, and optical isomers and pharmaceutically-acceptable acid addition salts thereof.

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4,382,031

## INTERMEDIATES FOR THE PREPARATION OF BIOTIN

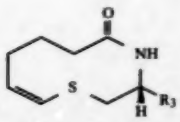
Enrico G. Baggiolini, Bloomfield; Hsi L. Lee, West Paterson, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 243,171, Mar. 12, 1981, Pat. No. 4,320,056, which is a division of Ser. No. 150,116, May 15, 1980, Pat. No. 4,284,557, which is a division of Ser. No. 43,282, May 29, 1979, Pat. No. 4,247,704, which is a continuation-in-part of Ser. No. 965,660, Dec. 1, 1978, Pat. No. 4,245,104, which is a continuation-in-part of Ser. No. 822,119, Aug. 5, 1977, Pat. No. 4,130,713. This application Nov. 23, 1981, Ser. No. 324,326

Int. Cl.³ C07D *281/00*

U.S. Cl. 260—239.3 R 6 Claims

1. An optically active compound of the formula:



IV'–VI'

wherein $R_3$ is —$COOR_1$, —CHO or

$R_1$ is lower alkyl, aryl or aryl (lower) alkyl and $R_2$ is aryl (lower) alkyl, in which the aryl moiety in the above substituents is phenyl, naphthyl, anthryl, phenanthryl or azulyl which

can be unsubstituted or substituted in one or more positions with halogen, nitro, lower alkenedioxy, lower alkyl or lower alkoxy, or its racemate.

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4,382,032

## DIAZEPINE DERIVATIVES

Walter Hunkeler, Magden, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

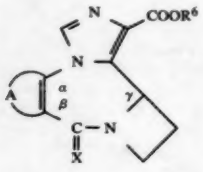
Division of Ser. No. 349,405, Feb. 16, 1982, Pat. No. 4,352,816. This application Jul. 30, 1982, Ser. No. 403,946

Claims priority, application Switzerland, Feb. 27, 1981, 1339/81

Int. Cl.³ C07D *513/22, 487/14*

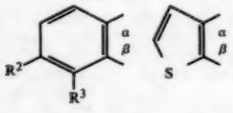
U.S. Cl. 260—239.3 P 1 Claim

1. A compound of the formula



Ib

wherein A together with the two carbon atoms denoted as α and β is the group



(a) or (b)

X is an oxygen or sulphur atom and

$R^6$ is lower alkyl with the proviso that

$R^6$ is not methyl, ethyl, isopropyl or t-butyl and $R^2$ is hydrogen, trifluoromethyl or halogen and $R^3$ is hydrogen, trifluormethyl, halogen or lower alkyl.

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4,382,033

## NOVEL PHTHALOCYANINE PIGMENTS

Michael T. Regan, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

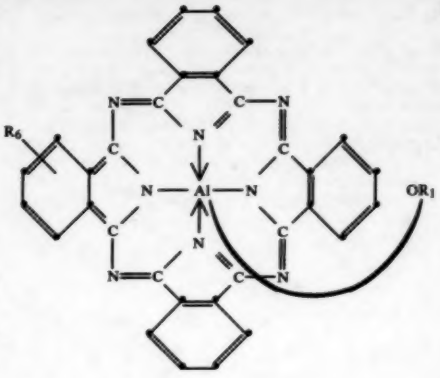
Division of Ser. No. 194,200, Oct. 6, 1980, Pat. No. 4,311,775. This application Oct. 5, 1981, Ser. No. 308,649

Int. Cl.³ C09B *47/04*

U.S. Cl. 260—245.74 3 Claims

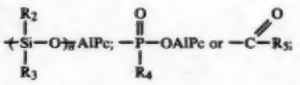
1. A phthalocyanine pigment having the structure:

I.



wherein:

$R_1$ represents



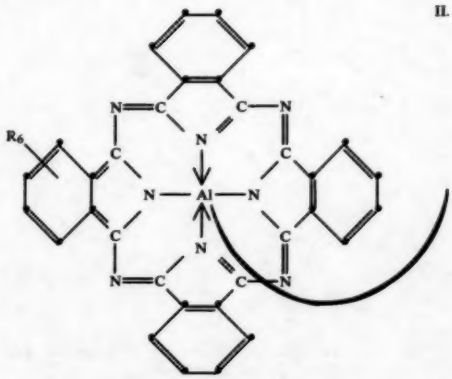
n represents 1, 2, 3 or any combination of 1, 2 and 3,

$R_2$, $R_3$, $R_4$ and $R_5$ represent alkyl, alkylaryl, alkoxy, alkoxyaryl, cycloalkyl, aryl, aralkyl or aryloxy;

$R_6$ represents hydrogen or chlorine and

AlPc represents

II.



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4,382,034

## PROCESS FOR THE PREPARATION OF DIANTHRAQUINONYLAMINES

Karl-Julius Reubke, and Josef Stawitz, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,692

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036374

Int. Cl.³ C07C *97/24*

U.S. Cl. 260—367 8 Claims

1. Process for the preparation of dianthraquinonylamines, characterised in that an optionally substituted nitroanthraqui-

none is reacted with an optionally substituted aminoanthraquinone in the presence of calcium oxide at an elevated temperature and in the absence of copper or copper compounds.

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**4,382,035**

## GLYCEROL-3-PHOSPHORIC ACID HALOGENOALKYL ESTERS AND PROCESSES FOR THEIR PREPARATION AND FURTHER CONVERSION

**Hansjörg Eibl, Bovenden, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany**

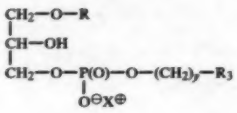
**Filed Mar. 24, 1981, Ser. No. 247,131**

**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011738**

**Int. Cl.³ A23J 7/00; C07F 9/02**

**U.S. Cl. 260—403** **2 Claims**

1. A glycerol-3-phosphoric acid halogenoalkyl ester of the formula



wherein

$R_3$ is halogen, $X\oplus$ is one equivalent of a monovalent or divalent cation, y is an integer from 2 to 12, and R is $—R_1$ or $—C(O)R_1$, wherein $R_1$ is linear or branched saturated or unsaturated aliphatic hydrocarbon having 1 to 25 carbon atoms.

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**4,382,036**

## PYROPHOSPHOBETAINES

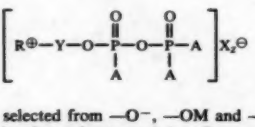
**Martin K. O. Lindemann, Bridgewater; Elvin R. Lukenbach, Somerset, and Robert J. Verdicchio, Succasunna, all of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.**

**Filed May 15, 1981, Ser. No. 263,959**

**Int. Cl.³ C07F 9/08**

**U.S. Cl. 260—403** **4 Claims**

1. A compound of the formula

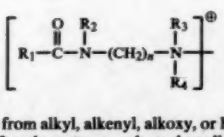


wherein A is selected from $—O^-$, —OM and $—O—Y—R^+$ with the proviso that at least one A is $—O^-$;

$X^-$ is an anion;

z is an integer from 0 to 3;

R is an amidoamine moiety of the formula



$R^1$ is selected from alkyl, alkenyl, alkoxy, or hydroxyalkyl of from 5 to 22 carbon atoms each, aryl or alkaryl of up to 20 carbon atoms;

$R^2$ is selected from hydrogen, alkyl, hydroxyalkyl or alkenyl of up to 6 carbon atoms each or cycloalkyl of up to 6 carbon atoms, or polyoxyalkylene of up to 10 carbon atoms;

$R^3$ and $R^4$ are the same or different and are selected from alkyl, hydroxyalkyl or carboxyalkyl of up to 6 carbon atoms and polyoxyalkylene of up to 10 carbon atoms; in addition, $R^3$ and $R^4$ taken together with the nitrogen to which they are attached, may represent an N-heterocycle, in which the Y radical is bonded to a ring atom of said N-heterocycle other than the nitrogen of the R moiety;

n is an integer from 2 to 12;

Y is selected from alkylene, optionally interrupted by up to 3 oxygen atoms, of up to 12 carbon atoms, or substituted alkylene substituted with alkyl, alkoxy, hydroxy or hydroxyalkyl, of not more than 10 carbon atoms each;

M is selected from hydrogen, an organic radical selected from alkyl or hydroxyalkyl of up to 6 carbon atoms, polyhydroxyalkyl of up to 10 carbon atoms, glyceryl, cycloalkyl of up to 6 carbon atoms, aryl or arylalkyl of up to 10 carbon atoms, or a salt radical selected from alkali metals and alkaline earth metals.

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**4,382,037**

## 3-FORMYL-4-METHYL-PENTANOIC ACIDS

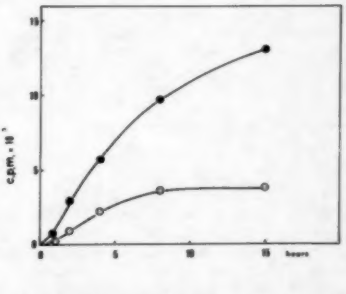
**Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France**

**Filed Mar. 23, 1981, Ser. No. 246,170**

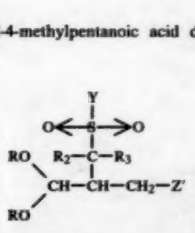
**Claims priority, application France, Mar. 28, 1980, 80 06978**

**Int. Cl.³ C07C 147/06**

**U.S. Cl. 260—465 F** **3 Claims**




1. A 3-formyl-4-methylpentanoic acid derivative of the formula



wherein Y is a monocyclic aromatic group selected from the group consisting of phenyl, tolyl and xylyl, $R_2$ and $R_3$ are individually alkyl of 1 to 4 carbon atoms or taken together with the carbon atom to which they are attached form a carbon homocycle of 3 to 6 carbon atoms, the Rs are alkyl of 1 to 6 carbon atoms or together form a polymethylene of 2 to 3 carbon atoms and Z' is selected from the group consisting of —COOH, cyano and $—COOR_1$ wherein $R_1$ is alkyl of 1 to 6 carbon atoms.

4,382,038

## HYDROCYANATION OF OLEFINS

Robert N. McGill, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 1, 1981, Ser. No. 307,649

Int. Cl.³ C07C *120/02, 121/26*

U.S. Cl. 260—465.8 R 7 Claims

1. An improved process for the production of dinitriles by the addition of hydrogen cyanide to pentenenitriles in the presence of a zero-valent nickel catalyst promoted with a triarylborane in a primary reaction zone under mild hydrocyanation conditions to produce a dinitrile product effluent from the primary zone having at least 1,000 ppm unreacted hydrogen cyanide therein, comprising passing said effluent and said catalyst through a secondary zone in the absence of added hydrogen cyanide while maintaining the effluent at a temperature in the range of about 45°–85° C. wherein the volume of the said secondary zone is sufficient to provide a residence time for the effluent of about 5 minutes to 2 hours.

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4,382,039

## PROCESS FOR THE PREPARATION OF 4-NITROTOLUENE-2-SULPHONIC ACID

Ernst Goldschmitt, Cologne; Peter Schnegg, and Heinz U. Blank, both of Odenthal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 139,496, Apr. 11, 1980, abandoned.

This application Apr. 20, 1982, Ser. No. 370,216

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916912

Int. Cl.³ C07C *143/24*

U.S. Cl. 260—505 R 11 Claims

1. In a process for the preparation of 4-nitrotoluene-2-sulphonic acid by reacting 4-nitrotoluene with gaseous sulphur trioxide at an elevated temperature, the improvement wherein molten 4-nitrotoluene is reacted with undiluted gaseous sulphur trioxide or gaseous technical grade $SO_3$ diluted up to 50% by volume at a temperature in the range from 60° to 150° C. under a pressure above the vapor pressure of 4-nitrotoluene, in a molar ratio of sulphur trioxide to 4-nitrotoluene of 0.1:1 to 1.5:1, said sulphur trioxide being introduced into said molten 4-nitrotoluene and, after a conversion of at least 70 percent of the reaction component not employed in excess is achieved, the sulphonation mixture is treated with water.

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4,382,040

## PROCESS FOR PRODUCTION OF 2,3-DIMERCAPTOPROPANE-1-SULFONIC ACID AND ITS SALTS

Wolfgang Parr, Berlin, Fed. Rep. of Germany, assignor to Heyl & Co., Berlin, Fed. Rep. of Germany

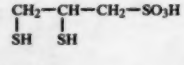
Filed Aug. 15, 1980, Ser. No. 178,588

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933027

Int. Cl.³ C07C *143/22*

U.S. Cl. 260—513 R 15 Claims

1. Process for production of 2,3-dimercaptopropane-1-sulfonic acid having the formula:



(I)

and its salts comprising:

(a) reacting an allyl halide with a sulfite to form a corresponding 2-propene-1-sulfonate and thereafter extracting the resulting solution with a solvent to remove unreacted allyl halide;

(b) brominating the product of step (a) to produce sodium-2,3-dibromopropane-1-sulfonate and subsequently removing excess bromine with sodium sulfite and adjusting the pH of the solution with alkali to from 4.5 to 8;

(c) reacting the product of step (b) with sodium hydrogen sulfide at room temperature over a period of about 30 hours in alkaline medium to produce sodium-2,3-dimercaptopropane-1-sulfonate;

(d) forming a complex of sodium-2,3-dimercaptopropane-1-sulfonate from step (c) with a bivalent metal ion selected from the group consisting of mercury, cadmium, tin, copper, nickel, cobalt and zinc and precipitating the complex with alcohol;

(e) reacting the product of step (d) in methanol with hydrogen sulfide;

(f) adjusting the pH of the reaction mixture to a value from about 4.0 to about 5.5;

(g) isolating the resulting 2,3-dimercaptopropane-1-sulfonic acid or salt thereof; and

(h) recrystallizing the product in an alcoholic medium selected from the group consisting of 90% ethanol and 90% isopropanol.

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4,382,041

## PROCESS FOR THE PRODUCTION OF AROMATIC CARBOXYLIC ACID CHLORIDES

Udo Rudolph; Manfred Schmidt; Dieter Freitag, and Ludwig Bottenbruch, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,223

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040294

Int. Cl.³ C07C *51/60*

U.S. Cl. 260—544 D 3 Claims

1. In the process of producing an aromatic carboxylic acid chloride by reacting an aromatic carboxylic acid with thionyl chloride, the improvement wherein said reaction is carried out in the presence of a catalytic amount of tertiary phosphine.

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4,382,042

## METHOD OF PREPARING OLIGOMERIC PHOSPHATE ESTERS

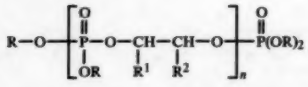
Thomas A. Hardy, Monroe, and Fred Jaffe, Ossining, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 892,550, Apr. 3, 1978, abandoned. This application Nov. 4, 1981, Ser. No. 318,288

Int. Cl.³ C07F *9/09*

U.S. Cl. 260—980 1 Claim

1. A method of preparing oligomeric phosphate ester compositions of the structural formula:



wherein R is $C_1$–$C_{10}$ alkyl or $C_1$–$C_{10}$ haloalkyl; $R^1$ and $R^2$ are the same or different and are hydrogen, $C_1$–$C_{10}$ alkyl or $C_1$–$C_{10}$ haloalkyl and n is an integer from zero to about 10; comprising first reacting $P_2O_5$ with a trialkyl or tris(haloalkyl)-phosphate of the structural formula:

wherein R is the same as defined above, at a temperature from about 0° C. to about 200° C. in the presence of about 0.01% to about 5% of a phosphite of the structural formula:

wherein R is as defined above; followed by reacting the inter-

mediate produced by the first reaction with an excess of an epoxide of the structural formula:

wherein $R^1$ and $R^2$ are as defined above, at a temperature from about 0° C. to about 200° C. in the presence of about 0.01% to about 5% of a Lewis acid catalyst, an alcohol, or a Lewis acid catalyst and an alcohol; followed by removal of volatile materials.

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**4,382,043**

## AUTOMATIC CHOKE

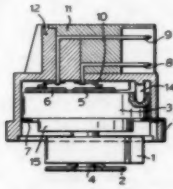
**Hidde Walstra; Gerrit J. Beunk and Peter G. van Riet Paap, all of Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 4, 1979, Ser. No. 81,756**

**Claims priority, application Netherlands, Oct. 4, 1978, 7810020**

**Int. Cl.³ F02M *1/12***

**U.S. Cl. 261—39 E** **6 Claims**



1. A control for a choke valve in a gasoline engine comprising

a subassembly having a disc, a stump fastened to the disc, a bimetallic helical spring which has a fixed end fastened to the stump and a movable end for operating the choke valve, and at least one electrical heating element, and

a housing having a cavity with a side wall accommodating the disc,

characterized in that

the disc has plural cavities therein, the housing has studs inside the housing cavity inserted into the disc cavities locating the disc in the housing cavity spaced from the side wall of the housing cavity, and an elastic ring is fitted into the housing cavity side wall holding the disc in the housing cavity.

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**4,382,044**

## WATER PURIFICATION SYSTEM EMPLOYING OZONE INJECTION

**Walter P. Baumgartner, Los Angeles, and Bruce O. Yancey, Tjunga, both of Calif., assignors to Carroll Shelby, Gardena, Calif., a part interest**

**Continuation of Ser. No. 141,467, Apr. 18, 1980, abandoned, which is a continuation of Ser. No. 17,478, Mar. 5, 1979, abandoned. This application Jun. 19, 1981, Ser. No. 275,259**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 261—76** **7 Claims**

1. A system for generating ozone and injecting it into a water stream comprising:

(a) an ozone generator including

(1) a plurality of oppositely positioned electrodes (**14*a*–14*d***),

(2) means (**13*a*–13*d***) for supporting said electrodes in spaced apart relationship with an air space being formed therebetween and air inlet means (**11*a***) at one end of said electrodes and air outlet means (**11*b***) at the other end thereof,

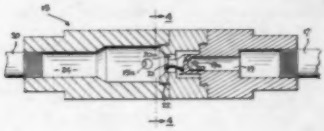
(3) means (**17**) for generating a high voltage potential, and

(4) means (**11*c*,11*d***) for feeding said potential between the oppositely positioned electrodes so as to cause an electric discharge and thereby generating ozone in said air space, and

(b) an injector nozzle device (**15**) including

(1) first chamber means (**20**) into which the water stream is fed at one end thereof, said chamber means having a wider portion and a narrowed neck portion (**20*a***) formed at the other end thereof,

(2) deflector means (**21**) mounted in said narrowed neck portion for deflecting the water stream outwardly in the form of a cone which expands at an increased velocity in the direction of water flow, a slit (**22**) being formed



between the outer edge of the deflector means and the outer end of the inner wall of the neck portion,

(3) second chamber means (**24**) connected at one end thereof to said first chamber means by said slit for forming an air pocket between a portion of the walls thereof and said cone, said second chamber means being substantially wider than said first chamber means, the water stream striking the walls of said second chamber means at a predetermined position therealong, and

(4) means for feeding ozone from said ozone generator to a portion of said second chamber means downstream of the deflector means proximate to said slit and directly into said air pocket,

a suction being developed in said air pocket which draws the ozone into said second chamber and injects it into the water stream.

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**4,382,045**

## CENTRIFUGAL GAS-LIQUID CONTACT APPARATUS

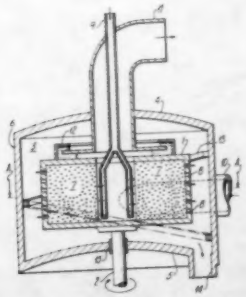
**James W. Wem, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England**

**Filed Aug. 18, 1981, Ser. No. 293,959**

**Claims priority, application United Kingdom, Sep. 11, 1980, 8029394**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 261—89** **2 Claims**



1. A centrifugal gas-liquid contact apparatus comprising:

a hollow cylindrical rotor rotatable about an axis, and hav-

ing a cylindrical outer peripheral sidewall having means defining a plurality of axially and angularly distributed gas inlet/liquid outlet apertures therethrough, for the inward passage of gas and outward passage of liquid, a first end wall, and a second end wall having means defining a central aperture therethrough;

a shaft operatively connected coaxially to the rotor at said first end wall so that rotation of the shaft produces corresponding rotation of the rotor;

a liquid feed pipe projecting axially into the rotor through said central aperture and, within the rotor having means defining a plurality of apertures through which liquid supplied to the feed pipe may be introduced to the interior of the rotor;

an annular mass of gas/liquid contact surfaces occupying the interior of the rotor in obscuring relation between said apertures of the liquid feed pipe and said apertures of the rotor outer peripheral sidewall;

a stationary gas discharge pipe coaxially communicated to said central aperture of said rotor second end wall in spacedly surrounding relation to said liquid feed pipe and via means providing a gas-tight, rotation-permitting interfacial seal between said rotor and said stationary gas discharge pipe;

wall means defining a cylindrical chamber spacedly enclosing said rotor and including a first end wall, a second end wall and a cylindrical sidewall;

means defining a liquid outlet conduit from said cylindrical chamber;

means defining a gas inlet conduit through said chamber sidewall, having an open end aimed tangentially of said chamber cylindrical sidewall towards said rotor cylindrical sidewall; and

liquid guide means disposed on the interior of said chamber cylindrical sidewall in a spiral having at least one turn about the chamber cylindrical sidewall, and disposed to deflect liquid, which issues out of the hollow cylindrical rotor and against the interior of said cylindrical sidewall with an angular component of motion, more directly towards said liquid outlet conduit than said liquid would flow towards said liquid outlet conduit in the absence of such deflection.

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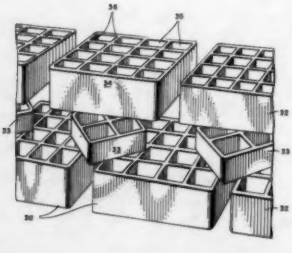
**4,382,046**

## WATER COOLING TOWER WITH LAYERS OF MULTI-CELL TILES AND SPACERS

**Paul A. Frohwerk, Granbury, Tex., assignor to Ceramic Cooling Tower Company, Fort Worth, Tex.**

**Filed Sep. 22, 1981, Ser. No. 304,695**
**Int. Cl.³ B01F *3/04***
**U.S. Cl. 261—94** **4 Claims**



1. In a liquid cooling tower having a plurality of vertically stacked layers of rectangular clay tiles, each of the tiles having a plurality of open cells extending vertically therethrough, each tile of each layer being offset from the tiles of the adjacent layers above and below the tile, and liquid supply means above the stacked layers of tiles for supplying liquid to be cooled to the stacked tiles whereby the liquid flows downwardly through the cells in the tiles and between adjacent tiles of a layer, the improvement comprising a layer of spacers between at least some adjacent layers of tiles for providing a vertical space between adjacent layers of tiles, said spacers having a horizontal cross sectional area less than the horizontal cross sectional area of said tiles, each of said spacers being generally rectangular and being formed from extruded clay and having a plurality of open cells extending vertically therethrough, the rectangular spacers being arranged at an angle of about 45° with respect to the rectangular tiles.

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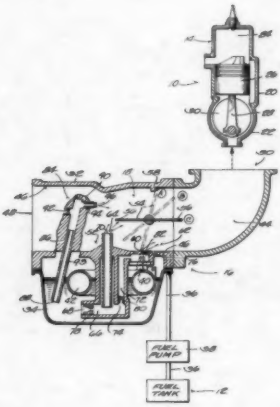
**4,382,047**

## CARBURETOR FOR INTERNAL COMBUSTION ENGINE

**Peter W. Brown, Waukegan; Chester G. DuBois, Zion, and Richard M. McChesney, Waukegan, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Continuation of Ser. No. 936,230, Aug. 24, 1978, abandoned.**
**This application Dec. 17, 1979, Ser. No. 104,401**
**Int. Cl.³ F02M *7/04***
**U.S. Cl. 261—41 D** **6 Claims**



1. A carburetor for an engine operative between a low speed, a high speed, and an intermediate speed between said low and said high speeds and including a combustion chamber, said carburetor including an air induction passage having an interior wall, an inlet end communicating with the atmosphere, an outlet end communicating with the combustion chamber, and a single venturi located intermediate said inlet and outlet ends, a butterfly valve having opposite end portions and being mounted in said air induction passage intermediate said venturi and said outlet end and being operable between a substantially closed position in which said opposite end portions are held in a close relationship relative to said interior wall for operating the engine at said low speed, a partially opened position for operating the engine at the intermediate speed, and a fully open position for operating the engine at the high speed, a fuel chamber, first fuel metering means for permitting passage of fuel from said fuel chamber to said induction passage when said butterfly valve is in said substantially closed position, and for constricting passage of fuel from said fuel chamber to said induction passage when said butterfly valve is in said partially open and said fully open positions, said first fuel metering means including an outlet port located in said induction passage interior wall intermediate said butterfly valve and said induction passage outlet and in close proximity to one of said butterfly valve opposite end portions when said butterfly valve is in said substantially closed position, a primary fuel passage having a primary inlet end communicating with said fuel chamber, a first fuel passage communicating with said outlet

port and having an inlet end communicating with said primary fuel passage, a first flow restriction means intermediate said primary inlet end and said first fuel passage inlet end, and a second flow restriction means in said first fuel passage, second fuel metering means for constricting passage of fuel from said fuel chamber to said induction passage when said butterfly valve is in said substantially closed position, and for permitting passage of fuel from said fuel chamber to said induction passage when said butterfly valve is in said partially open and said fully open positions, said second metering means including a second fuel passage communicating with said primary fuel passage downstream of said first flow restriction means and having an outlet portion extending partially into said venturi for discharging fuel into said induction passage when said butterfly valve is in said partially open and fully open positions, and third fuel metering means for constricting passage of fuel from said fuel chamber to said induction passage when said butterfly valve is in said substantially closed and said partially open positions, and for permitting passages from said fuel chamber to said induction passage when said butterfly valve is in said fully open position of a quantity of fuel in addition to the fuel discharged by said second fuel metering means when said butterfly valve is in said fully open position, said third fuel metering means including a third fuel passage having an inlet end communicating with said fuel chamber independently of said primary fuel passage, and an outlet portion communicating with said air induction passage intermediate said venturi and said induction passage inlet end and adjacent said venturi, and air bleed means including at least one aperture in said third fuel passage intermediate said outlet portion and said third fuel passage inlet end, said aperture being adapted to partially vent said third fuel passage to the atmosphere.

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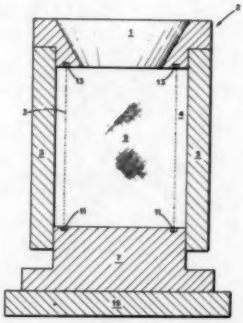
**4,382,048**

## METHOD FOR PRODUCING SINTERED CERAMIC, LAYERED, CIRCULAR FUEL PELLETS

**John L. Harlow, East Berne, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Sep. 14, 1981, Ser. No. 301,786**
**Int. Cl.³ G21C *21/00***
**U.S. Cl. 264—0.5** **14 Claims**



1. A method of producing a sintered high density ceramic fuel pellet comprising:

(a) locating at least two particulate ceramic materials having different particle sizes in a container;

(b) agitating said particulate materials in said container to form a mixture;

(c) locating said mixture in the center compartment of a compacting die, said compacting die being provided with a screen having a mesh size sufficient to pass at least one, but not all, of said particulate materials, said screen being positioned in the die cavity parallel to the side walls of said die dividing said die cavity into center and annular compartments;

(c) vibrating said compacting die to sift at least one, but not all, of said particulate materials from said center compartment into said annular compartment thereby producing a substantially uniform outer annular layer about a center core;

(d) removing said screen from said die;

(e) applying heat and pressure to said die in an amount sufficient to produce a sintered high density ceramic fuel pellet.

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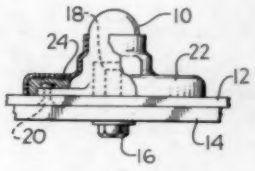
**4,382,049**

## FORMING A LIGHTNING SPARK ISOLATION BARRIER

**Michael G. Hofmeister, Long Beach, and Myron P. Amason, Stanton, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.**

**Filed Nov. 30, 1981, Ser. No. 326,142**
**Int. Cl.³ B29C *6/00***
**U.S. Cl. 264—40.1** **6 Claims**




1. A method of making a lightning spark isolation barrier for surrounding a fastener comprising the steps of:

determining the areas of sparking and Joule heating of the fastener;

evaluating the isolation potential of the dielectric material to be used;

defining a cavity surrounding the fastener to be isolated with the dielectric material;

creating a cap to enclose the cavity surrounding the fastener, and

using the cap to hold a defined amount of dielectric isolation material in viscous plastic form surrounding the critical sparking and Joule heating areas of the fastener until the isolation material has cured to a hardened state.

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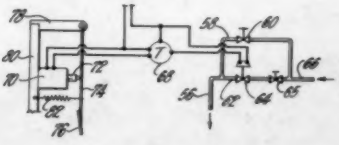
**4,382,050**

## METHOD FOR HANDLING HEAT-SOFTENABLE BATCH MATERIAL

**Stephen Seng, Frazeysburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Continuation of Ser. No. 49,865, Jun. 18, 1979, abandoned, which is a continuation of Ser. No. 809,595, Jun. 24, 1977, abandoned. This application Nov. 6, 1981, Ser. No. 318,883**
**Int. Cl.³ B01J *2/14***
**U.S. Cl. 264—40.4** **3 Claims**



1. In a method of pelletizing particulate glass batch material

to form pellets having a select uniformity of size range and a select nominal diameter range, comprising:

(a) feeding under controlled flow conditions a supply of said particulate glass batch material onto an inclined rotating pelletizing disc,

(b) feeding under controlled flow conditions a pelletizing water spray onto said particulate glass batch material on said rotating disc while tumbling and rolling said batch material on said disc, whereby pellets of particulate glass batch material are formed, which roll and tumble over an annular wall of said inclined rotating pelletizing disc, and

(c) sensing glass batch material at a select location on said rotating disc, the improvement comprising: where, in step (c), the depth of said material on said rotating disc is sensed, and

(d) regulating the flow of said batch material or water to said disc in response to said sensed depth of material to maintain a ratio of water to said batch material on said disc to produce said pellets having said select uniformity of size range and said select nominal diameter range.

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**4,382,051**

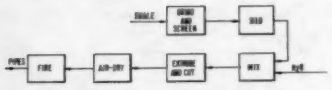
**METHOD FOR FIRING CERAMIC PRODUCTS**

**John F. Booth, Sheffield, England, assignor to The Hepworth Iron Company Limited of Sheffield, Sheffield, England**

**Division of Ser. No. 42,615, May 25, 1979, Pat. No. 4,264,301. This application Nov. 25, 1980, Ser. No. 210,289**

**Int. Cl.³ F27B *9/14***

**U.S. Cl. 264—57** **10 Claims**



1. A method of making cylindrical ceramic articles in which the articles are formed of a ceramic material; the formed articles are transported individually through a kiln by a conveying means including members which move along the kiln and which separate and control the translation of the individual articles; the articles are subjected to firing while travelling through the kiln; the articles are continuously rotated by rolling on a surface of a kiln extending along at least that part of the length of the kiln in which the articles are at their greatest temperature; and the articles are transported along at least one further part of the length of the kiln without rolling.

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**4,382,052**

**PROCESS FOR VULCANIZATION OF ELASTOMER PRODUCTS**

**Toshio Arimatsu, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan**

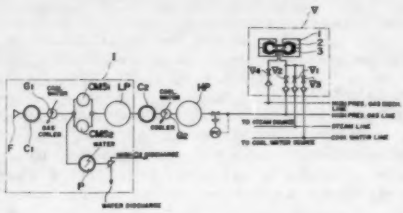
**Filed Oct. 16, 1981, Ser. No. 311,945**

**Claims priority, application Japan, Oct. 27, 1980, 55-151170**

**Int. Cl.³ B29H *5/02***

**U.S. Cl. 264—85** **6 Claims**

1. A process for vulcanization of elastomer products which comprises the steps of heating under pressure, the elastomer product mounted in a metal mold by supplying thereto vulcanizing medium, suspending the supply of said vulcanizing medium when said elastomer product has reached a predetermined temperature or passed through a predetermined time period, and subsequently supplying inert gas preliminarily extracted from atmospheric air with use of molecular sieves, and maintained at least under approximately the same pressure as that of said vulcanizing medium as a heat retaining medium, up to the termination of remaining time period for the heating



step so as to maintain the elastomer product at said predetermined temperature.

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**4,382,053**

**HOT PRESSING OF CERAMIC MATERIALS**

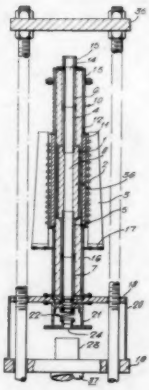
**Frank Rigby, Blackpool, England, assignor to United Kingdom Atomic Energy Authority, London, England**

**Filed Jul. 27, 1981, Ser. No. 287,107**

**Claims priority, application United Kingdom, Aug. 1, 1980, 8025235**

**Int. Cl.³ B28B *5/00***

**U.S. Cl. 264—120** **11 Claims**



1. Apparatus for hot pressing ceramic material comprising:

a fixed heated zone,

a column of interfitting dies within the heated zone, each die defining at least one bore for containing the ceramic material to be hot-pressed and being adapted to align itself and cooperate under pressure with adjacent dies directly to cause densification of ceramic material within the bores,

means for applying intermittent pressure to the column of dies to cause said densification by movement of the dies relative to each other to increase the extent of interfitting of adjacent dies

and further means for passing the dies intermittently through the heated zone.

4,382,054

## METHOD FOR PRODUCING DISPOSABLE TARGETS FOR SHOOTING SPORTS AND OTHER SIMILAR PURPOSES

Pentti Hukkanen, Valmutie 14 A4, 90580 Oulu 58, Finland

Filed Dec. 18, 1980, Ser. No. 217,837
Claims priority, application Finland, Dec. 21, 1979, 794018
Int. Cl.³ C04B 7/34
U.S. Cl. 264—123 8 Claims

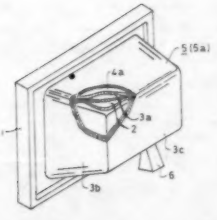
1. Method for producing a disposable target, usable in shooting sports comprising the steps of mixing $CaSO_4.2H_2O$ and a CaO containing substance in the form of a second powder to provide a powder mixture thereof, and thereafter subjecting the powder mixture to sufficiently high molding pressure for substantially instantaneously congealing the mixture to solid form to provide such target.

4,382,055

## LIGHTWEIGHT AND DIMENSIONALLY ACCURATE RESIN CONCRETE MOLDED PRODUCTS, AND A METHOD OF MAKING THE SAME

Takuji Koyanagi, 3-58, Kikyo-Ga-Oka 3 ban-cho, Nabari, Mie; Nobuhiro Ono, 2820, Saimyoji, Ueno, Mie, and Hiroyuki Kitamura, 4049, Midori-Ga-Oka Minami-Machi, Ueno, Mie, all of Japan

Filed Oct. 3, 1980, Ser. No. 193,727
Claims priority, application Japan, Feb. 21, 1980, 55-21276
Int. Cl.³ A47K 1/04; B32B 5/28
U.S. Cl. 264—133 5 Claims




1. A method of making a shrinkage resistant molded resin concrete product, which consists essentially of the following steps:

a. forming a first reinforcing layer comprising a fiber reinforced plastic on a mold surface;

b. applying resin concrete having a resin content of about 10 to 70%, and containing a hot curing composition onto said first reinforcing layer to form an intermediate layer thereon;

c. applying a fiber reinforced plastic capable of solidifying faster than said resin concrete onto said resin concrete to form a second reinforcing layer on said intermediate layer, said fiber reinforced plastic forming said second reinforcing layer being applied before solidification of said resin concrete, whereby an incompletely cured molded product is obtained; and

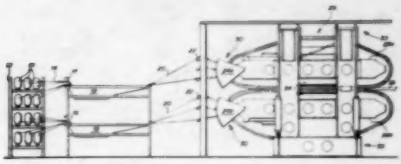
d. fully curing said molded product.

4,382,056

## CONTINUOUS PROCESS AND APPARATUS FOR FABRICATING FIBER REINFORCED PLASTIC GRATING ARTICLES

William C. Coonrod, Richardson, Tex., assignor to Fibergrate Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 20,164, Mar. 13, 1979, Pat. No. 4,276,337, which is a division of Ser. No. 889,392, Mar. 23, 1978, Pat. No. 4,164,439. This application Sep. 16, 1980, Ser. No. 187,796
Int. Cl.³ B29C 27/26
U.S. Cl. 264—137 9 Claims



1. A process for producing elongated fiber reinforced structures which include transverse members comprising:

(a) coating continuous strands of reinforcing fibers with a thermosetting plastic resin;

(b) introducing said strands into the space between upper and lower endless molding tracks, at least one of said tracks comprising molding teeth;

(c) rotating said upper and lower endless molding tracks to form a molding cavity having said continuous strands contained longitudinally therein along a portion of the length of said molding tracks;

(d) allowing said transverse members to be formed from a flow of excess resin carried into said molding cavity by said continuous strands; and

(e) heating said molding cavity to set said thermosetting resin and form said structure.

4,382,057

## SILICONE RUBBER COMPOSITIONS FOR LIQUID INJECTION MOLDING MACHINES

Luisito A. Tolentino, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,697
Int. Cl.³ B28B 1/24
U.S. Cl. 264—328.2 49 Claims

1. A silicone rubber composition which in the uncured state does not have a viscosity that exceeds $1.5 \times 10^6$ centipoise at 25° C. and has a Durometer in the cure state that exceeds 60 comprising:

(A) 100 parts by weight of a linear vinyl terminated diorganopolysiloxane polymer having a viscosity that is in the range of 100 to 100,000 centipoise at 25° C. where the organo group is a monovalent hydrocarbon radical and the vinyl content varies from 0.05 to 0.20 weight percent;

(B) from 10 to 50 parts by weight of fumed silica;

(C) from 5 to 50 parts by weight of calcined diatomaceous earth;

(D) from 1 to 200 parts per million of platinum as a platinum catalyst; and

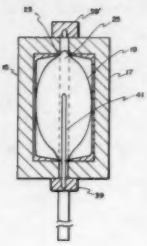
(E) from 1 to 50 parts by weight of a hydride-containing organopolysiloxane cross-linking agent wherein the hydrogen content varies from 0.2 to 1.0 percent by weight where the organo group is a monovalent hydrocarbon radical.

4,382,058

## PROCESS FOR FORMING A SINGLE-WALLED BLOW MOLDED HINGED CONTAINER

Keith M. Watson; Floyd L. Jones, and Dwight V. Adams, all of Roanoke Rapids, N.C., assignors to W. R. Grace & Co., Cryovac Division, Duncan, S.C.

Filed Mar. 26, 1980, Ser. No. 133,777
Int. Cl.³ B29C 17/07, 17/14
U.S. Cl. 264—527 3 Claims



1. A process for forming a single-walled blow molded container comprising a top portion and a bottom portion connected by a compression molded hinge portion, comprising the steps of:

initiating closing of a blow mold comprising means defining a restricted hinge forming minor cavity connecting major cavities and communicating with hinge bar introducing means and hinge bar receiving means about a parison;

inserting a hinge bar through said hinge bar introducing means so as to pierce said parison, pass through said restricted hinge forming minor cavity and into said hinge bar receiving means;

completing said closing of said blow mold about said parison to compression mold a portion of said parison located between said hinge bar and a surface of said restricted hinge forming minor cavity;

inflating said parison to form an article by conforming said parison to the geometry of said cavities;

removing the article from the blow mold; and

severing the article to form two of said containers.

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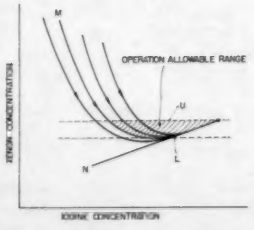
4,382,059

## POWER CHANGE OPERATING METHOD OF A BOILING WATER REACTOR

Kazuyori Doi; Takashi Kiguchi, and Naoyuki Yamada, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1980, Ser. No. 154,998
Claims priority, application Japan, Jun. 6, 1979, 54-70055
Int. Cl.³ G21L 7/36
U.S. Cl. 376—210 4 Claims




1. A method for changing thermal power of a nuclear reactor by controlling the speed of a recirculation pump of the reactor comprising the steps of:

(a) calculating the current thermal power in accordance with heat balance signals derived from the reactor and generating electrical signals of the thermal power;

(b) calculating xenon and iodine concentrations in accordance with the electrical signals of the thermal power and generating electrical signals of the xenon and iodine concentrations;

(c) calculating upper and lower limits of xenon concentration for different final power values in accordance with the relation between the thermal power and core flow in the current control rod pattern and generating electrical signals of the upper and lower limits;

(d) calculating transitional changes in the xenon and iodine concentrations after a power change for different initial values in accordance with the following equations,

$$\frac{dI}{dt} = \gamma_I \Sigma_f P - \lambda_I I$$

and

$$\frac{dXe}{dt} = \gamma_X \Sigma_f P + \lambda_I I - \lambda_X Xe - \delta_X XeP,$$

wherein:

Xe and I: Mean concentrations of $Xe^{135}$ and $I^{135}$ at

$\Sigma_f$: Means macroscopic fission cross section at core,

P: Mean thermal power at core,

$\lambda_X$ and $\lambda_I$: Decay constants of $Xe^{135}$ and $I^{135}$, and

$\gamma_X$ and $\gamma_I$: Numbers of $Xe^{135}$ and $I^{135}$ generated at each fission,

and generating electrical signals of the transitional changes;

(e) determining operating allowable ranges for the different initial values in accordance with the electrical signals generated in steps (c) and (d); and

(f) controlling the speed of the recirculating pump to maintain the current xenon and iodine concentrations within the operating allowable range.

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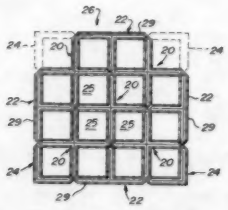
4,382,060

## RADIOACTIVE FUEL CELL STORAGE RACK

Maurice Holtz, Huntingdon Valley, Pa., and Krishna P. Singh, Cherry Hill, N.J., assignors to Joseph Oat Corporation, Camden, N.J.

Filed May 22, 1980, Ser. No. 152,275
Int. Cl.³ G21C 19/00
U.S. Cl. 376—272 9 Claims




1. A structural element for defining walls of cells in a radioactive fuel storage rack comprising a hollow metal element which is cruciform in section so as to have four legs of uniform length, said element being defined by a plurality of sheet metal members welded together and defining a hollow interior space of cruciform shape which extends into said legs, each leg of said element being adapted to be a dividing wall between two adjacent cells, a neutron absorbing shield of cruciform shape, said shield filling said hollow interior, each end of each leg

being configured to mate with a leg on a mating structural element which is adapted to define at least one wall of a cell.

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4,382,061

## ALLOY PREPARATION FOR PERMANENT MAGNETS

Camillo Herget; Hans-Günter Domazer, both of Essen, and Mircea Velicescu, Bochum, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Aug. 5, 1981, Ser. No. 290,248

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040342

Int. Cl.³ C22C *19/00*

U.S. Cl. 420—435 1 Claim

1. A cobalt/rare earth metal alloy in the atomic ratio of 5:1 to 7:2, and being suitable for the production of permanent magnets, where the rare earth metal component is composed of

about 40 to 60 atomic percent of samarium,

about 15 to 30 atomic percent of lanthanum,

about 15 to 30 atomic percent of neodymium, and

the remainder is a content of other rare earth metals resulting from preparation.

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4,382,062

## TEST AGENT FOR THE DETECTION OF COUPLING COMPOUNDS, AND A PROCESS FOR ITS PREPARATION

Helmut Kohl, Wetter, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,375

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021305

Int. Cl.³ G01N *33/52, 33/72*

U.S. Cl. 422—56 7 Claims

1. A stabilized rapid diagnostic agent for the detection of coupling compounds in biologic fluids consisting essentially of an adsorbent carrier matrix comprising fleeces, paper, asbestos or polymer films, said matrix being impregnated with a diazonium salt as reagent for said coupling compounds and a phosphonium salt as stabilizer for said rapid diagnostic agent wherein said phosphonium salt is present in an effective amount to stabilize said rapid diagnostic agent.

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4,382,063

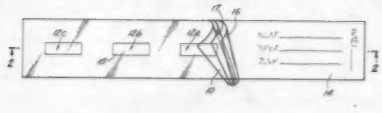
## STERILE INDICATOR DEVICE

Vincent A. Romito, North Hollywood, and Loran H. Bruso, Ontario, both of Calif., assignors to Parke-Davis Company, Morris Plaines, N.J.

Continuation of Ser. No. 73,761, Sep. 10, 1979, abandoned, which is a continuation of Ser. No. 257,782, Apr. 27, 1981, abandoned. This application May 24, 1982, Ser. No. 380,978

Int. Cl.³ G01N *21/78, 33/00*

U.S. Cl. 422—57 6 Claims



1. A sterility indicator device comprising:

a. a base of absorbent material which is permeable to saturated steam;

b. indicator means reactive to predetermined combinations of time, temperature and saturated steam mounted on one surface of said base, said indicator means being of the type which evolves corrosive gaseous reaction products upon reacting with saturated steam;

c. a first gas impermeable, transparent covering film bonded by adhesive means to said one surface of said base and overlaying said indicator means;

d. a second gas impermeable covering film bonded by adhesive means to another surface of said base such that said base and indicator means are interposed between said first and said second covering films, the edge portions of said base being exposed so that steam enters said base via said exposed edge portions, said steam moving through said base into contact with said indicator means to react with said indicator means, said indicator means being spaced from said exposed edge portions so that said steam must move through said base to contact said indicator means, said base and said first and second covering films preventing the corrosive gaseous reaction products evolved by said indicator means from escaping from the device, thereby forcing said corrosive gaseous products to be absorbed into said absorbent base; and

e. said absorbent base having a gaseous absorption volume sufficient to absorb essentially all of said corrosive gaseous reaction products whereby essentially no corrosive gaseous reaction products escape from the indicator device but are contained within said indicator device so that materials being sterilized by the saturated steam will not be damaged by contact with said corrosive gaseous products.

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4,382,064

## SPECIMEN SLIDE FOR OCCULT BLOOD TESTING

Michael B. Detweiler, San Jose; Paul J. Lawrence, Campbell, and Charles W. Townsley, San Jose, all of Calif., assignors to SmithKline Instruments, Inc., Sunnyvale, Calif.

Division of Ser. No. 229,430, Jan. 29, 1981, Pat. No. 4,329,317. This application Feb. 11, 1982, Ser. No. 348,112

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ G01N *33/72*

U.S. Cl. 422—58 4 Claims

1. In a specimen test slide for occult blood having a front panel, a rear panel, said front panel having a plurality of openings, a specimen receiving sheet carrying a guaiac test reagent between the front and rear panels, pivotal covers in said front and rear panels opposite said openings, the improvement comprising: said pivotal covers being coated with a composition containing 2,6-di-tert-butyl-p-cresol.

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4,382,065

## FLUIDIZED BED APPARATUS AND METHOD OF USING

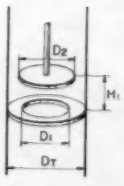
Akinobu Shiga; Masahiro Kakugo; Koji Yamada, and Hajime Sadatoshi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 23, 1981, Ser. No. 304,871

Claims priority, application Japan, Sep. 26, 1980, 55/134820

Int. Cl.³ F27B *15/08*

U.S. Cl. 422—147 6 Claims



1. A fluidized bed apparatus in which solid particles are fluidized by means of an ascending stream gas, said fluidized bed apparatus being provided in the free board thereof with an internal element at least a part of which rotates; said internal element being a member selected from a group consisting of:

(a) an internal element having a rotating body possessing a tuyere structure of conical shape so that the projected area

ratio to the free board sectional area expressed in $[(D_T-2l_1)/D_T]^2$ is not less than 0.8 and the opening proportion to the free board sectional area is not less than 0.3, where $D_T$ represents the inside diameter at free board of the fluidized bed apparatus and $l_1$ represents the distance from the end of the longest blade to the inner wall of the fluidized bed apparatus;

(b) an internal element having a propeller fan structure which is an assembly of inclined blades and has the projected area ratio to the free board sectional area expressed in $[(D_T-2l_1)D_T]^2$ of not less than 0.8 and the opening proportion to the free board sectional area of not less than 0.3; and

(c) an internal element consisting of a combination of disc or cone, and annular body, in which the annular body has an outer diameter equal to the diameter of the reactor and the opening proportion expressed in $[(D_1/D_T)^2]$ of not less than 0.3 wherein $D_1$ represents the inner diameter, and the disc or cone shares the same center with annular body and has the opening proportion expressed $[(D_T^2-D_2^2)/D_T^2]$ of not less than 0.3 wherein $D_2$ represents the bottom diameter of the disc or cone and the projected area ratio of the free board sectional area expressed in $[1-(D_1^2-D_2^2)/D_T^2]$ of not less than 0.8.

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**4,382,066**

## URANIUM EXTRACTION PROCESS

**Mark A. Rose, Brierley Hill, England, assignor to Albright & Wilson Limited, Warley, England**

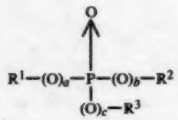
**Filed Oct. 9, 1979, Ser. No. 82,574**

**Claims priority, application United Kingdom, Oct. 10, 1978, 40066/78**

**Int. Cl.³ C01G *43/00***

**U.S. Cl. 423—10** **19 Claims**

1. A process for extracting uranium from a wet process phosphoric acid containing uranium, which process comprises contacting said phosphoric acid, which contains 35–60% by weight of $P_2O_5$ and uranium at least some of which is in the hexavalent state, with a solution in an inert non polar water immiscible organic solvent of a neutral phosphorus compound of formula



where each of a, b and c, which are the same or different, is 0 or 1, and each of $R^1$, $R^2$ and $R^3$, which are the same or different, is an alkyl, cycloalkyl or alkenyl group, and an acid ester of formula $(R^4O)_2PO(OH)$, where $R^4$ is as defined for $R^1$–$R^3$, and wherein said phosphoric acid containing uranium contains nitrate ion in an amount between 0.05 and 10% to form an organic extract phase containing uranium and an aqueous phosphoric acid, which are separated.

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**4,382,067**

## SOLVENT EXTRACTION OF PLATINUM GROUP METALS

**Richard A. Grant, Uxbridge, England, assignor to Matthey Rustenburg Refiners (Pty.) Ltd., Johannesburg, South Africa**

**Continuation of Ser. No. 213,489, Dec. 5, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,054**

**Claims priority, application United Kingdom, Dec. 17, 1979, 7943376**

**Int. Cl.³ C01G *55/00***

**U.S. Cl. 423—22** **11 Claims**

1. A process for the separation or purification of platinum group metals in which either platinum, iridium (IV) and/or palladium (II) are present in aqueous solution together with at least one of rhodium and ruthenium and one or more base metals comprising the steps of:

(a) contacting the said aqueous solution of a pH of less than 1 with an organic hydrocarbon extraction solvent containing at least one nitrogen containing organic compound selected from the group consisting of primary, secondary and tertiary amines and quarternary ammonium compounds and at least one oxygen containing organic compound selected from the group consisting of alcohols, phenols and carboxylic acids;

(b) removing from contact with the said aqueous solution the said organic phase now containing the platinum, iridium (IV) and/or palladium (II) extracted from the aqueous solution together with the nitrogen- and oxygen-containing organic compounds while leaving other platinum group metals and base metals in the aqueous solution; and

(c) contacting the organic phase obtained at stage (b) above with an aqueous solution of a strong acid and thus stripping the platinum, iridium and/or palladium from the said organic phase and obtaining an aqueous solution of the said metals.

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**4,382,068**

## METHOD FOR SELECTIVE RECOVERY OF MOLYBDENUM AND VANADIUM VALUES FROM SPENT CATALYSTS

**Naganori Rokukawa, Tsuchiura, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan**

**Filed Nov. 17, 1981, Ser. No. 322,290**

**Claims priority, application Japan, Dec. 2, 1980, 55-169937**

**Int. Cl.³ C01G *39/00, 31/00***

**U.S. Cl. 423—53** **10 Claims**

1. A method for selectively recovering molybdenum and vanadium values from a spent catalyst used for the hydrogenation desulfurization of petroleums containing molybdenum, vanadium, nickel and cobalt values supported by or deposited on an alumina catalyst carrier which comprises (a) suspending and agitating the spent catalyst in an aqueous extractant solution of sodium carbonate and hydrogen peroxide to effect selective extraction of the molybdenum and vanadium values into the aqueous solution and (b) separating the aqueous solution from the undissolved residue.

5. The method as claimed in claim 1 wherein the step (a) is carried out at room temperature.

6. The method as claimed in claim 1 wherein the step (a) is carried out for at least 30 minutes.

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**4,382,069**

## MULTIPLE BATCH RECOVERY OF ACID DISSOLVED MOLYBDENUM

**Herman R. Heytmeijer, Whippany, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Aug. 12, 1982, Ser. No. 407,678**

**Int. Cl.³ C01G *39/00***

**U.S. Cl. 423—56** **5 Claims**

1. A multiple batching method for rapidly and efficiently recovering molybdenum from a mixed sulfuric acid-nitric acid aqueous solution having substantial quantities of molybdenum dissolved therein, said mixed acid solution having been used to dissolve molybdenum mandrels from coiled tungsten filaments, which method comprises:

a. diluting a first portion of said mixed acid solution with water to a first predetermined acid-water volume ratio,

b. adding anhydrous ammonia to said diluted first portion of said solution at a predetermined rate sufficient to cause the solution temperature to rise to at least about 90° C., maintaining the solution temperature at less than its boiling temperature, and continuing the controlled anhydrous ammonia addition to said solution while maintaining the solution temperature of at least about 90° C. but less than

the solution boiling temperature until the solution pH is from about 1.5 to about 3.5,

c. seeding the partially neutralized solution with a small predetermined amount of ammonium molybdate solid particles,

d. maintaining the seeded solution at a temperature of at least about 90° C. but less than the solution boiling temperature until substantially all molybdenum is precipitated therefrom as ammonium molybdate, and separating the resulting precipitated ammonium molybdate from residual solution,

e. adding an additional portion of said mixed acid solution to said separated ammonium molybdate, diluting said added additional portion of said mixed acid solution with water to a second predetermined acid-water volume ratio, redissolving the precipitated ammonium molybdate while adding anhydrous ammonia to said solution at a predetermined rate sufficient to cause the solution temperature to rise to at least about 90° C. but less than its boiling temperature, and continuing the controlled anhydrous ammonia addition to said solution while maintaining the solution temperature of at least about 90° C. but less than the solution boiling temperature until the solution pH is from about 1.5 to about 3.5, maintaining the solution at a temperature of at least about 90° C. but less than the solution boiling temperature until substantially all molybdenum is precipitated therefrom as ammonium molybdate, separating the resulting precipitated ammonium molybdate from residual solution, and repeating the foregoing steps utilizing additional batch amounts of spent acid solution to accumulate additional batch amounts of precipitated ammonium molybdate,

f. washing the precipitate by adding water to the precipitated ammonium molybdate, agitating the slurry, allowing substantially all the precipitate to settle, removing the wash water from the settled precipitate, and repeating the foregoing washing as required to remove substantially all soluble impurities from said precipitate.

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**4,382,070**

## PROCESS FOR PRODUCING XEROGEL OF SILICIC ACID WITH HIGH VOLUME OF PORES

**Ivan Novák, No. 7 Pod Rovnicami, and Dušan Berek, No. 27 Fucíkova, both of Bratislava, Czechoslovakia**

**Continuation-in-part of Ser. No. 165,184, Jul. 1, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 335,094**

**Claims priority, application Czechoslovakia, Jul. 9, 1979, 4807-79**

**Int. Cl.³ C01B *33/16***

**U.S. Cl. 423—338** **5 Claims**

1. A process for producing xerogel of silicic acid with a high volume of pores, consisting essentially of:

(A) hardening wet hydrogel of polymeric silicic acid by aging for about 3 to 24 hours in a concentrated acid selected from the group consisting of sulphuric, hydrochloric, phosphoric, nitric and trichloracetic acids, the minimum concentrations thereof being 90 wt. %, 37 wt. %, 55 wt. %, 65 wt. % and 98 wt. %, respectively, the amount of acid being such that the final concentration of said acid in the acid-hydrogel mixture is higher than 20 wt. %,

(b) removing said mineral or organic acid by washing and subsequently washing the hydrogel with an organic water-miscible solvent followed by washing with an organic water-immiscible solvent, thereby forming a lyogel,

(c) stabilizing said lyogel by heating and annealing at temperatures of from 200° to 950° C., wherein the xerogel produced has a higher pore volume than an xerogel produced according to said process absent the washing step with the organic water-immiscible solvent.

**4,382,071**

## PROCESS OF PREPARING SILICON TETRAFLUORIDE BY USING HYDROGEN FLUORIDE GAS

**Toyozo Otsuka, Kamifukuoka; Naomichi Kitsugi, Tokorozawa, and Teruo Fujinaga, Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan**

**Filed Jul. 1, 1981, Ser. No. 279,614**

**Claims priority, application Japan, Jul. 2, 1980, 55-89104; Feb. 16, 1981, 56-20113**

**Int. Cl.³ C01B *33/08***

**U.S. Cl. 423—341** **9 Claims**

1. A process of preparing silicon tetrafluoride, comprising the step of introducing hydrogen fluoride gas into a slurry obtained by dispersing a silicon oxide material in finely divided form in sulfuric acid wherein the principle component of said silicon oxide material is amorphous silicon oxide such that the concentration of $H_2SO_4$ in the liquid phase of the reaction system never becomes lower than 65% before completion of reaction between hydrogen fluoride and silicon oxide wherein the reaction is carried out at a temperature between room temperature and about 55° C.

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**4,382,072**

## CATALYTIC PREPARATION OF SULFURYL FLUORIDE

**George S. Fujioka, Walnut Creek, and Danae A. Vanderhoof, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Nov. 16, 1981, Ser. No. 321,868**

**Int. Cl.³ C01B *17/45***

**U.S. Cl. 423—468** **6 Claims**

1. In a process for preparing sulfuryl fluoride by the reaction of sulfur dioxide, chlorine and hydrogen fluoride, the improvement comprising the use of an effective amount of palladium, platinum, rhodium, rhenium, vanadium, chromium or salts thereof on a compatible support as a catalyst.

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**4,382,073**

## METHOD FOR PROCESSING A SOLID GRAVEL LIKE MATERIAL WITH A FLUID

**Harald Krogsrud, Gjettum, Norway, assignor to Elkem a/s, Oslo, Norway**

**Filed Jan. 14, 1981, Ser. No. 224,918**

**Claims priority, application Norway, Jan. 18, 1980, 800118**

**Int. Cl.³ B01D *11/00***

**U.S. Cl. 423—658.5** **2 Claims**

1. A method for treating a granular material with a leaching liquid in a bath, said bath having an upper end portion and a lower end portion, comprising the steps of:

(a) introducing at least an initial bottom layer of granular material into the lower end portion of the bath, said granular material being introduced into the bath through a centrally arranged vertical tube rotatably disposed within the bath, said vertical tube having at least one lifting member rigidly fixed thereto, said lifting member being

formed adjacent to and above at least one opening in said vertical tube;

(b) rotating said vertical tube with said lifting member thereon for creating a volume under said lifting member by lifting of the previous material, said granular material in said tube thereby flowing outwardly from said opening into said volume, said rotation thereby continuously introducing new layers of granular solid material in said lower end portion, each subsequent new layer being introduced beneath the layers previously introduced whereby each of the layers is gradually lifted in said bath by the continuous introduction of new layers thereunder;

(c) introducing a liquid into said bath at the upper end portion thereof; and

(d) withdrawing liquid from said bath at the lower end portion thereof whereby the liquid and granular solid material travel in a counter current manner with respect to each other.

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4,382,074

## SCINTILLATION PROXIMITY ASSAY

**Hiram Hart, 3450 Wayne Ave., Bronx, N.Y. 10467**

**Continuation-in-part of Ser. No. 890,325, Mar. 27, 1978, Pat. No. 4,271,139. This application Aug. 4, 1980, Ser. No. 175,132**

**Int. Cl.³ G01N** *33/58, 33/60*

**U.S. Cl. 436—537** **12 Claims**

1. In an improved non-destructive method of biological fluid assay wherein antibodies link antigen-coatings on fluid suspensions of both a plurality of tritiated-particulates and potentially scintillating-particulates within activating range one to the other, each of said linked scintillating-particulates emitting detectable light-pulses upon activation responsive to bombardment of energy from each of said linked tritiated-particulates within said range, said detectable light-pulses initially measured correlatively to the amount of said antibody in said fluid, the improvement wherein of adding a known amount of said antigen-coated tritiated particulates and said antigen-coated scintillating particulates to said fluid, measuring the resulting detectable light-pulses and correlating the reduction in measured light-pulses from said initially measured light-pulses to the reduction in the amount of antibodies in said fluid linked to said two particulates, and this being correlative to the amount of unbound antigens initially available in said fluid.

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4,382,075

## STABILIZED ROMANOWSKY STAIN SOLUTION

**John C. Liao, Elkhart; John L. Ponzo, Mishawaka, and Ellen M. Jenning, South Bend, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Apr. 3, 1981, Ser. No. 250,732**

**Int. Cl.³ G01N** *1/30;* **C09B** *67/00, 67/18*

**U.S. Cl. 424—3** **6 Claims**

1. A Romanowsky-type stain comprising azures, methylene blue and an eosin dye in methanol solution which contains from 0.55 to 0.9 weight percent of a combination of dimethylamine hydrochloride and a second stabilizer which is a secondary or tertiary alkylamine hydrochloride of the formula $R_2NH_2^+Cl^-$ or $R_3NH^+Cl^-$ where R is ethyl, n-propyl or n-butyl said dimethylamine hydrochloride and secondary or tertiary alkylamine hydrochloride being present in a ratio of dimethylamine hydrochloride to the other stabilizer in the range of from about 1:10 to 1:3.5.

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4,382,076

## HEPATITIS A ANTIBODY ASSAY

**William M. Hurni; William J. Miller, both of North Wales, and William J. McAleer, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 97,299, Nov. 26, 1979, abandoned. This application Jun. 1, 1982, Ser. No. 383,668**

**Int. Cl.³ G01N** *33/48, 33/54;* **C12Q** *1/70*

**U.S. Cl. 436—531** **5 Claims**

1. A method of preparing a diagnostic reagent for use in an assay for hepatitis A antibody comprising contacting an opaque or transparent surface, the surface being substantially free of metallic globules and having hepatitis A antibody adhered thereto, with a cell culture fluid containing hepatitis A antigen whereby the surface has an inner layer of hepatitis A antibody and an outer layer of hepatitis A antigen.

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4,382,077

## PESTICIDE FOGGING COMPOSITIONS AND SOLVENT THEREFOR

**Emanuel Buchbinder, Beer-Sheva, Israel, assignor to Makhteshim Chemical Works Ltd., Beer-Sheva, Israel**

**Continuation-in-part of Ser. No. 104,988, Dec. 18, 1979, abandoned. This application Feb. 25, 1981, Ser. No. 238,085**

**Claims priority, application Israel, Dec. 29, 1978, 56337**

**Int. Cl.³ A01N** *25/06, 25/18, 25/20, 25/00*

**U.S. Cl. 424—40** **10 Claims**

1. A pesticidal fogging composition for application by a fogging device operating on thermal evaporation of the solvents, said composition comprising 1 to 40 parts by weight of the composition of a liquid or solid pesticide concentrate capable of being applied by fogging, dissolved or dispersed in a solvent system consisting essential of 38 to 80 parts glycol or a glycol ether solvent, 2 to 20 parts of an alcohol having 1 to 3 carbon atoms and 18 to 60 parts methylene dichloride.

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4,382,078

## NOVEL WATER-BASED, DIMETHYL ETHER-PROPELLED AEROSOL COMPOSITION

**Hendrik J. Berkhoff, Epe, and Rudolf Zagt, Woudenberg, both of Netherlands, assignors to Polak's Frutal Works B.V., Amersfoort, Netherlands**

**Filed Jan. 23, 1981, Ser. No. 228,030**

**Claims priority, application United Kingdom, Jan. 21, 1980, 8001911**

**Int. Cl.³ C09K** *3/30*

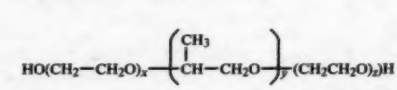
**U.S. Cl. 424—45** **5 Claims**

1. A water-based, dimethyl ether-propelled aerosol composition consisting essentially of:

(a) about 0.3 to 5% active ingredients;

(b) about 15 to 35% dimethyl ether;

(c) about 1 to 6% surfactant, said surfactant being a block copolymer of ethylene oxide and propylene oxide having the general structural formula



wherein x+z is a whole number between about 18 and 200, y is a whole number greater than about 21, and the polyethylene oxide blocks constitute about 20 to 80% of the total molecule by weight; and

(d) the remainder water.

4. A composition according to claim 1 wherein the active ingredient is an insecticidal agent.

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4,382,079

## BICARBONATE CONTAINING STICK DEODORANT

**Frank W. Marschner, Whitehouse Station, N.J., assignor to Colgate/Palmolive, New York, N.Y.**

**Division of Ser. No. 845,503, Oct. 25, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 12,761**

**Int. Cl.³ A61K** *7/32*

**U.S. Cl. 424—65** **14 Claims**

1. A stable anhydrous deodorant stick comprising sodium or potassium bicarbonate as the essential deodorizing agent, and about 0–10% suspending agent, dispersed in a soap based gel which comprises about 20–90% by weight polyhydric alcohol

gelled by about 2–15% by weight of an alkali metal salt of a $C_{14}$–$C_{20}$ saturated fatty acid.

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**4,382,080**

## METHOD FOR TREATING AND PREVENTING BACTERIAL INFECTIONS

**Tetsuo Shiba, Toyonaka; Yuichi Yamamura, Takarazuka; Shozo Kotani, Minoo; Osamu Nagase, and Hidemasa Ogawa, both of Minamifunabori, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 77,808, Sep. 21, 1979, abandoned. This application May 11, 1981, Ser. No. 262,244**

**Claims priority, application Japan, Sep. 21, 1978, 53-116155**

**Int. Cl.³ A61K *37/00***

**U.S. Cl. 424—177** **5 Claims**

1. A method for therapeutic treatment and/or prophylaxis of bacterial infections which comprises administering an anti-bacterial infection therapeutically effective amount or an anti-bacterial infection prophylactic effective amount of a compound selected from the group consisting of 6-O-stearoyl-N-acetyl-muramyl-L-alanyl-D-isoglutamine, 6-O-stearoyl-N-acetyl-muramyl-L-seryl-D-isoglutamine, 6-O-stearoyl-N-acetylmuramyl-L-valyl-D-isoglutamine, and 6-O-docosanoyl-N-acetyl-muramyl-L-alanyl-D-isoglutamine to a patient who does or does not have a bacterial infection.

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**4,382,081**

## INHIBITORS OF MAMMALIAN COLLAGENASE

**Joseph E. Sundeen, Yardley, Pa., and Tamara Dejneka, Skillman, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

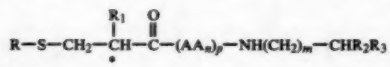
**Filed Jun. 12, 1981, Ser. No. 273,142**

**The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.**

**Int. Cl.³ A61K *37/00*; C07C *103/52***

**U.S. Cl. 424—177** **10 Claims**

1. A compound of the formula



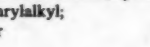
or salts thereof

wherein

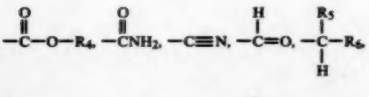
R is hydrogen, alkanoyl of 2 to 10 carbon atoms or arylcarbonyl;

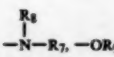
$R_1$ is alkyl of 3 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, aryl or arylalkyl;

$R_2$ is hydrogen or



$R_3$ is



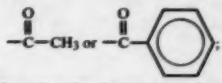


$R_4$ is hydrogen, lower alkyl or arylalkyl;

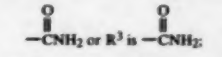
$R_5$ and $R_6$ are each independently selected as $—OCH_3$ or $—OCH_2CH_3$ or are combined as $—OCH_2—CH_2—O—$ or $—O—(CH_2)_3—O—$;

$R_7$ and $R_8$ are each independently selected as hydrogen, lower alkyl or are combined as $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2—O—CH_2CH_2—$;

$R_9$ is hydrogen, lower alkyl,



m is an integer from 0 to 7; p is an integer from 1 to 3 with the proviso that when p is 1, $R_2$ is -(lower alkyl)



$AA_n$ is an amino acid chain or from one to three amino acids;

n is 1 or 1, 2 or 1, 2, 3;

when p is 1, $AA_n$ is $AA_1$;

when p is 2, $AA_n$ is $AA_1—AA_2$;

when p is 3, $AA_n$ is $AA_1—AA_2—AA_3$;

$AA_1$ is glycine or alanine;

$AA_2$ is glycine or alanine;

$AA_3$ is leucine, glutamine or isoleucine, and physiologically acceptable salts thereof.

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**4,382,082**

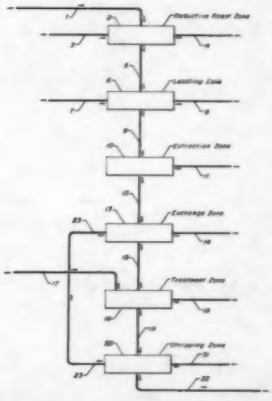
## RECOVERY OF COBALT VALUES BY ABSORPTION FROM AMMONIACAL SOLUTION

**William C. Laughlin, Schaumburg, Ill., and William K. Tolley, Salt Lake City, Utah, assignors to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 217,974, Dec. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 90,220, Nov. 1, 1979, abandoned. This application Dec. 21, 1981, Ser. No. 333,245**

**Int. Cl.³ C01G *51/00***

**U.S. Cl. 423—150** **10 Claims**



1. In a process for the recovery of cobalt values from a cobalt-bearing source which comprises treating said source at an elevated temperature, leaching the resultant reduced source with an ammoniacial ammonium salt solution, adsorbing dissolved cobalt ions on a solid carbonaceous adsorbent and recovering the adsorbed cobalt ions, the improvement which comprises treating said solid adsorbent with a gaseous hydrogen stripping agent at an elevated temperature prior to recovery of said cobalt ions.

4,382,083

## THERAPEUTIC METHOD FOR TREATING BLOOD-CLOTTING DEFECTS WITH FACTOR VIIA

William R. Thomas, Laguna Niguel, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 25, 1981, Ser. No. 277,469
Int. Cl.³ A61K 35/14
U.S. Cl. 424—101 19 Claims

1. A method for treating a patient having a clotting factor defect, comprising administering to the patient an effective hemostatic amount of factor VIIa, which factor VIIa is uncontaminated by other activated blood clotting factors having sufficient activity alone to produce a hemostatic effect.

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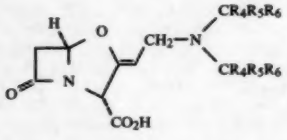
4,382,084

## ANTIBIOTICS

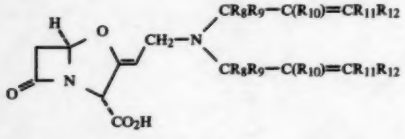
Roger J. Ponsford, Dorking, and Thomas T. Howarth, Ewhurst, both of England, assignors to Beecham Group Limited, England

Division of Ser. No. 944,808, Sep. 22, 1978, which is a division of Ser. No. 731,928, Oct. 13, 1976, abandoned. This application Mar. 10, 1980, Ser. No. 129,188
Claims priority, application United Kingdom, Oct. 13, 1975, 41887/75
Int. Cl.³ A61K 35/00
U.S. Cl. 424—114 65 Claims

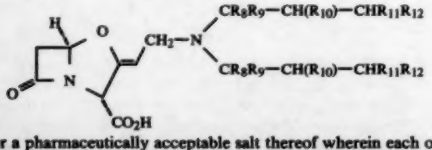
36. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof a synergistically effective amount of an *in vivo* hydrolyzable ester of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein $R_4$ is hydrogen, $R_5$ is hydrogen or alkyl of 1 to 4 carbon atoms and $R_6$ is phenyl unsubstituted or substituted by a substituent selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and hydroxyl,



or a pharmaceutically acceptable salt thereof wherein each of $R_8$ to $R_{11}$ is independently hydrogen or methyl and $R_{12}$ is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl unsubstituted or substituted by a substituent selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and hydroxyl, or



or a pharmaceutically acceptable salt thereof wherein each of $R_8$ to $R_{11}$ is independently hydrogen or methyl and $R_{12}$ is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl unsubstituted or substituted by a substituent selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, alkoxyl of 1 to 4 carbon atoms and hydroxyl, an antibacterially effective amount of amoxycillin or a pharmaceutically acceptable salt thereof.

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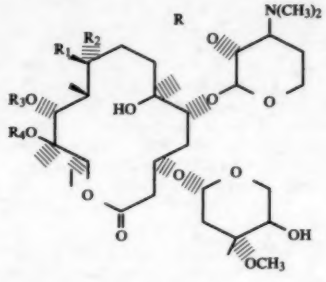
4,382,085

## 4''-EPI ERYTHROMYCIN A AND DERIVATIVES THEREOF AS USEFUL ANTIBACTERIAL AGENTS

Frank C. Sciavolino, Niantic, and Mark A. Guadliana, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,547
Int. Cl.³ C07H 17/8; A61K 31/70
U.S. Cl. 424—180 13 Claims

1. A compound selected from the group consisting of a macrolide antibiotic of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R is selected from the group consisting of hydrogen, alkanoyl having from two to three carbon atoms and ethyl succinyl; $R_1$ and $R_2$ when considered separately are, respectively, hydroxy and hydrogen; $R_1$ and $R_2$ when considered together are an oxo group; $R_3$ and $R_4$ when considered separately are each hydrogen; and $R_3$ and $R_4$ when considered together are >C=O.

13. An antibacterial pharmaceutical composition comprising from about 0.5 to about 90 percent by weight of the total composition a compound as claimed in claim 1 and a pharmaceutical carrier.

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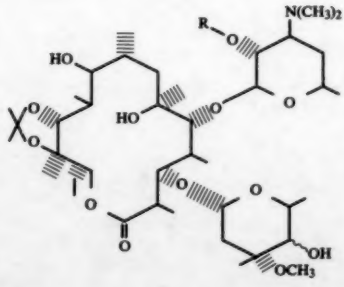
4,382,086

## 9-DIHYDRO-11,12-KETAL DERIVATIVES OF ERYTHROMYCIN A AND EPI-ERYTHROMYCIN A

Frank C. Sciavolino, Niantic, and James R. Hauske, East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,548
Int. Cl.³ A61K 31/70; C07H 17/8
U.S. Cl. 424—180 5 Claims

1. A compound selected from the group consisting of a macrolide of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R is selected from the group consisting of hydrogen, alkanoyl having two to three carbon atoms and ethyl succinyl.

5. An antibacterial pharmaceutical composition comprising from about 0.5 to about 90 percent by weight of the total composition a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

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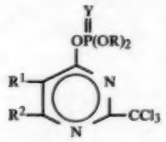
**4,382,087**

## SELECTED O-(2-TRICHLOROMETHYL-4-PYRIMIDINYL)-O,O-DIALKYL PHOSPHOROTHIONATES AND O-(2-TRICHLOROMETHYL-4-PYRIMIDINYL)-O,O-DIALKYL PHOSPHORONATES AND THEIR USE AS INSECTICIDES

**Lawrence E. Katz, Orange; Walter A. Gay, Cheshire, and Eugene F. Rothgery, North Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

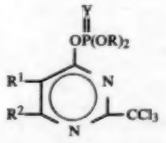
**Filed May 4, 1981, Ser. No. 259,791**
**Int. Cl.³ A01N 57/16; C07F 9/65**
**U.S. Cl. 424—200** **20 Claims**

1. A compound having the formula:



wherein Y is an atom selected from the group consisting of sulfur and oxygen; R is a lower alkyl group having 1 to 4 carbon atoms; $R^1$ is hydrogen, a lower alkyl group having 1 to 4 carbon atoms, halo or nitro; and $R^2$ is a lower alkyl group having 1 to 4 carbon atoms or an amino group.

12. A method of controlling insects which comprises contacting said insects with an insecticidally effective amount of a compound having the formula:



wherein Y is an atom selected from the group consisting of sulfur and oxygen; R is a lower alkyl group having 1 to 4 carbon atoms; $R^1$ is hydrogen, a lower alkyl group having 1 to 4 carbon atoms, halo or nitro; and $R^2$ is a lower alkyl group having 1 to 4 carbon atoms or an amino group.

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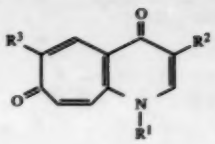
**4,382,088**

## 4,7-DIHYDRO-4,7-DIOXI-1H-CYCLOHEPTA[B]PYRIDINE DERIVATIVES

**Bozidar Palameta, Dollard des Ormeaux; Tibor Bogri, St. Laurent, and Jehan Bagli, Kirkland, all of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada**

**Filed Aug. 21, 1981, Ser. No. 295,180**
**Int. Cl.³ C07D 221/04; A61K 31/435**
**U.S. Cl. 424—256** **11 Claims**

1. A compound of formula I



(I)

in which $R^1$ is $CH_2COOR^4$ wherein $R^4$ is hydrogen or lower alkyl; $R^2$ is $COOR^5$ wherein $R^5$ is hydrogen or lower alkyl; and $R^3$ is lower alkoxy, benzyloxy or $OCH_2COOR^6$ wherein $R^6$ is hydrogen or lower alkyl; with the provisos that when $R^4$ is hydrogen then $R^5$ and $R^6$ is hydrogen, and that when $R^4$ is lower alkyl then $R^5$ and $R^6$ are lower alkyl with $R^4$ and $R^6$ being the same lower alkyl; or a therapeutically acceptable salt, with an organic or inorganic base, of the compound of formula I having carboxyls.

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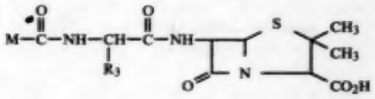
**4,382,089**

## ANTIBACTERIAL AMIDE COMPOUNDS, COMPOSITIONS THEREOF AND METHODS OF USING THEM

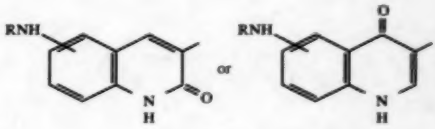
**Theodore H. Haskell, Ann Arbor, and Marland P. Hutt, Saline, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Mar. 2, 1982, Ser. No. 321,019**
**Int. Cl.³ A61K 31/47; C07D 499/70, 215/56**
**U.S. Cl. 424—258** **23 Claims**

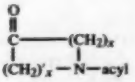
1. A compound of the formula



and pharmaceutically acceptable salts thereof; wherein M is



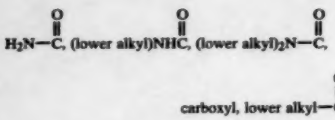
R is



or $R_1$-$[NR_4$-acyl$]_n$; x is an integer from one to five, x' is zero, one or two; $R_1$ is hydrogen, lower alkyl, benzyl, or

wherein $R_2$ is hydrogen, amino or a lower alkyl group of from one to four carbon atoms, optionally substituted by from one to three chlorine or fluorine atoms; $R_4$ is hydrogen or lower alkyl; N-acyl is an aminoacyl moiety derived from a carboxylic acid

of from two to ten carbon atoms optionally substituted by from one to three of the following groups, formamido, lower alkylamido, hydroxyl,



amino, carbamido, carbonyl oxygen, lower alkoxy, lower alkylthio, or sulfonic acid; $R_3$ is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl and n is an integer of from one to four.

**19**. An antibacterial pharmaceutical composition comprising a compound of claim **1** in at least an effective antibacterial amount and a pharmaceutical carrier.

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**4,382,090**

## N-THIAZOLYLMETHYLTHIOALKYL-N'ALKYLAMIDINES AND RELATED COMPOUNDS

**Richard P. Pioch, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 193,192, Oct. 2, 1980, Pat. No. 4,375,547. This application Nov. 6, 1981, Ser. No. 319,155**

**Int. Cl.³ A61K** *31/425;* **C07D** *277/20*

**U.S. Cl. 424—270** **7 Claims**

**1**. A pharmaceutical formulation in unit dosage form adapted for oral administration to achieve an antisecretory effect, comprising per dosage unit an antisecretorially-effective amount of N-methyl-N'-2-(2-dimethylaminomethyl-4-thiazolylmethylthio)ethyl 2-nitro-1,1-ethenediamine or a pharmaceutically acceptable acid addition salt thereof plus one or more pharmaceutical excipients.

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**4,382,091**

## STABILIZATION OF 1-SUBSTITUTED IMIDAZOLE DERIVATIVES IN TALC

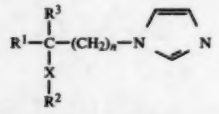
**Eric J. Benjamin, Sunnyvale; Maryann O. Lee, Fremont, and Lih-Yang Lin, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Filed Apr. 30, 1981, Ser. No. 259,228**

**Int. Cl.³ A01N** *43/50;* **A61K** *31/415*

**U.S. Cl. 424—273 R** **10 Claims**

**1**. A stable talc-based powder composition comprising 0.01% to 10% (w/w) of an acid addition salt of the compound represented by the formula:



(I)

wherein $R^1$ and $R^2$ are independently alkyl (1–12), alkenyl (2–12), substituted or unsubstituted phenyl, substituted or unsubstituted phenyl lower alkyl (1–6), or substituted or unsubstituted phenyl lower alkenyl (2–6), wherein substituted with reference to phenyl refers to phenyl substituted by one or more lower alkyl (1–6), halo, lower alkoxy (1–6), trifluoromethyl, nitro or cyano groups; $R^3$ is hydrogen or lower alkyl (1–6); X is sulfur, sulfoxide or sulfone; and n is an integer of from 1 to 4; 0.05% to 10% (w/w) of a basic metal salt of phosphoric acid, orthophosphoric acid, hypophosphoric acid, pyrophosphoric acid, nitric acid, sulfuric acid, boric acid, carbonic acid, or an alkyl or alkenyl, mono or dicarboxylic acid of 1–10 carbon atoms; and an excipient containing talc in a quantity sufficient to provide a final composition containing at least 50% (w/w) talc.

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**4,382,092**

## PHARMACEUTICAL COMPOSITION COMPRISING GAMMA-BUTYROBETAINE FOR THE TREATMENT OF SYNDROMES INDUCED BY L-CARNITINE DEFICIENCY

**Claudio Cavazza, Rome, Italy, assignor to Sigma-TAU Industrie Farmaceutiche Riunite S.p.A., Rome, Italy**

**Filed Dec. 21, 1981, Ser. No. 332,562**

**Claims priority, application Italy, Jan. 6, 1981, 47518 A/81**

**Int. Cl.³ A61K** *31/205*

**U.S. Cl. 424—316** **5 Claims**

**3**. A therapeutical method for the treatment of patients exhibiting L-carnitine deficiency syndromes, which comprises orally or parenterally administering to said patients a therapeutically effective amount of gamma-butyrobetaine.

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**4,382,093**

## 9-AMINOALKYLFLUORENES

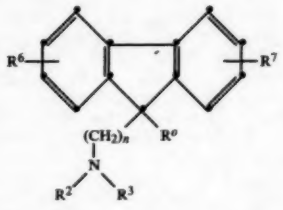
**William B. Lacefield, Indianapolis, and Richard L. Simon, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Division of Ser. No. 141,228, Apr. 17, 1980, Pat. No. 4,277,495, which is a continuation-in-part of Ser. No. 19,533, Mar. 12, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 232,281**

**Int. Cl.³ A61K** *31/165, 31/135, 31/24, 31/275*

**U.S. Cl. 424—324** **15 Claims**

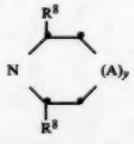
**1**. A pharmaceutical formulation useful in the treatment of cardiac arrhythmias which comprises a carrier or diluent admixed with an antiarrhythmic amount of a 9-aminoalkylfluorene antiarrhythmic agent of the formula



wherein:

$R^o$ is hydroxy, cyano, $CONR^4R^5$ or $COOR^9$ in which $R^4$ and $R^5$ independently are hydrogen or $C_1$–$C_6$ alkyl and $R^9$ is hydrogen or $C_1$–$C_4$ alkyl;

$R^2$ and $R^3$ independently are hydrogen, $C_1$–$C_6$ alkyl, $CH_2C_2$–$C_5$ alkenyl, phenyl-$C_1$–$C_3$ alkyl; or taken together with the nitrogen to which they are attached are a cyclic group of the formula



in which $R^8$ is hydrogen or $C_1$–$C_4$ alkyl; A is $CH_2$, O or NH; and y is zero or one; provided that $R^2$ is hydrogen when $R^1$ is hydroxy;

n is 3, 4 or 5;

$R^6$ and $R^7$ independently are hydrogen, $C_1$–$C_4$ alkyl or halogen; and the pharmaceutically acceptable salts thereof.

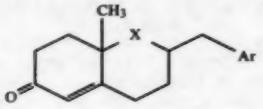
4,382,094

## REDUCED NAPHTHALENES, THEIR PREPARATION AND USE

Alexander C. Goudie, Harlow, and Josephine M. Cox, Stevenage, both of England, assignors to Beecham Group Limited, England

Filed Jul. 29, 1981, Ser. No. 288,178
Claims priority, application United Kingdom, Jul. 30, 1980, 8024971
Int. Cl.³ A61K *31/135*
U.S. Cl. 424—330 9 Claims

1. A compound of formula (I):




(I)

wherein:

Ar is phenyl, optionally substituted by one or more $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, halogen, nitro, hydroxy or $NR_1R_2$ wherein $R_1$ and $R_2$ are selected from hydrogen or $C_{1-6}$ alkyl;

the dotted lines represent an optionally present double bond; and

X is CO or $CR_1OH$ wherein $R_1$ is hydrogen or $C_{1-4}$ alkyl; or a pharmaceutically acceptable salt thereof.

8. An anti-inflammatory pharmaceutical composition adapted for topical administration which comprises an effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

9. A method of treatment or prophylaxis of inflammation in mammals including man which comprises the topical administration of a therapeutically effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof.

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4,382,095

## PHARMACEUTICAL METHODS AND COMPOSITIONS USING PARABENZOQUINONE

Channing B. Ewing, P.O. Box 47, East Lake Weir, Fla. 32632

Filed Apr. 20, 1982, Ser. No. 370,066
Int. Cl.³ A61K *31/12*
U.S. Cl. 424—331 2 Claims

1. A method for treating the symptoms of asthma, said method comprising administering to a person suffering therefrom an effective amount of parabenzoquinone and continuing said administration, as required, until the asthma symptoms have been alleviated.

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4,382,096

## PROCESS FOR THE PREPARATION OF HIGH QUALITY WHEAT BREAD CAPABLE OF LONG TERM STORAGE

Istvan Janosi, Kalocsa; Tihamer Jankovits, Batya; Lajos Kiss, Budapest; Anna Toth nee Balogh, Kalocsa; Benõ Nagy, Janos Hadjinak, both of Budapest, all of Hungary, assignors to Kolacsai Suto-Es Edesipari Vallalat, Kalocsa, Hungary

Continuation-in-part of Ser. No. 226,614, Jan. 21, 1981, abandoned. This application Jul. 24, 1981, Ser. No. 286,671
Claims priority, application Hungary, Jan. 28, 1980, 175
Int. Cl.³ A21D *2/00*
U.S. Cl. 426—21 6 Claims

1. A process for producing a high quality wheat bread with a long shelf-life, comprising the steps of:

(a) preparing a bread leaven by combining wheat flour, yeast, water and a leavening initiator and ripening said leaven at a temperature of 30°–32° C. for 6 to 8 hours;

(b) homogenizing a dry flour mixture of wheat flour and digested cornflake flour to form a homogeneous flake mixture, said digested corn flake flour prepared by subjecting corn kernels to a treatment with steam at 105° C. for at least 10 minutes to allow penetration of the corn kernels by the steam to cause breakdown of the starch molecules in the corn kernels, followed by milling said product;

(c) contacting said dry flour mixture homogenized in step (b) with an effective amount of the bread leaven formed in step (a), a yeast, water and salt to form a bread dough, said dough being formed by combining said leaven, the components of said flour mixture, said yeast, said salt and water in proportions such that said dough contains about 32 kg of the ripened leaven for 0.4 to 0.5 kg of yeast dispersed in 3.5 to 5 liters of water, 1.1 to 1.5 kg of salt in about 15 liters of water, 4 to 5.5 kg of wheat flour of grade BL 80, 25 to 29 kg of wheat flour of grade BL 55 and 1.5 to 2.24 kg of digested corn flakeflour;

(d) kneading the dough;

(e) resting said kneaded dough to permit water equalization therein;

(f) portioning said dough;

(g) allowing the portioned dough to rise for a period of 50 to 70 minutes; and

(h) baking the portioned dough for a period of about 35 minutes at a temperature of about 250° C.–280° C.

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4,382,097

## METHOD FOR THE PREPARATION OF NATURALLY THICKENED AND STABILIZED FERMENTED MILK PRODUCTS AND PRODUCTS PRODUCED THEREBY

Ebenezer R. Vedamuthu, and Ramesh B. Shah, both of Bradenton, Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed May 1, 1981, Ser. No. 259,451
Int. Cl.³ A23C *17/00, 9/12;* C12R *1/225, 1/46*
U.S. Cl. 426—43 17 Claims

1. A thick bodied liquid, fermented milk product which comprises: milk with a pH between about 4.2 and 4.7 which has been fermented with a mixed culture containing a milk fermenting, non-slime, lactic acid producing bacteria and slime producing *Streptococcus lactis, Streptococcus cremoris* or mixtures thereof having the thickening and stabilizing characteristics of *Streptococcus cremoris* NRRL-B-12,361, 12,362 or 12,363 to produce the thick bodied milk product without need for added milk solids and without resulting in a slimy or ropy product, wherein the product is stable to separation of whey from curd upon storage at refrigeration temperatures without added stabilizing agents, said slime producing *Streptococcus lactis* or *Streptococcus cremoris* alone further being capable of producing a Zahn cup viscosity of about 300 centipoises or above when incubated in milk for 16 hours at 24° C.

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4,382,098

## SAUSAGE EMULSIONS CONTAINING GLUCONATE SALTS AND PROCESS OF PREPARATION

Hubert Bolin, Park Forest, Ill.; James N. Bacus, Gainesville, Fla., and Ronald O. Barhaug, Darien, Ill., assignors to Swift & Company, Chicago, Ill.

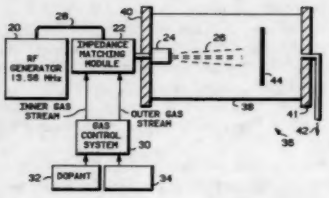
Continuation of Ser. No. 236,793, Feb. 23, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,276
Int. Cl.³ A23L *1/31*
U.S. Cl. 426—646 10 Claims

1. A processed sausage product containing sodium chloride in which the normal sodium chloride content has been reduced by the addition of from 0.1 to 2.5%, based upon the weight of the final sausage product, of a salt system consisting of calcium or sodium gluconate in combination with an alkaline phosphate.

## 4,382,099
## DOPANT PREDEPOSITION FROM HIGH PRESSURE PLASMA SOURCE

Ronald N. Legge, Scottsdale, and Kalluri R. Sarma, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1981, Ser. No. 314,609
Int. Cl.³ B05D 1/08
U.S. Cl. 427—34 10 Claims

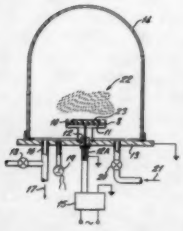



1. A method for predepositing dopant material on a semiconductor substrate without codepositing an insulator or semiconductor which comprises the steps of: providing a high pressure plasma reactor apparatus; positioning a semiconductor substrate in said apparatus; generating within said apparatus a high pressure rf plasma at a pressure of about one atmosphere or greater; introducing dopant material to said plasma to form ionized species of said dopant; and directing said plasma and said ionized species to impinge upon said semiconductor substrate and to deposit thereon a layer of dopant material only.

## 4,382,100
## APPLICATION OF A LAYER OF CARBONACEOUS MATERIAL TO A SURFACE

Leslie A. Holland, Crawley, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 824,111, Aug. 12, 1977, abandoned. This application Mar. 11, 1981, Ser. No. 242,530
Claims priority, application United Kingdom, Aug. 13, 1976, 33794/76
Int. Cl.³ B05D 3/02
U.S. Cl. 427—38 10 Claims



1. A method of applying a non-crystalline carbonaceous material to a surface consisting of the steps of:
(1) placing the surface in a single enclosure;
(2) evacuating the single enclosure;
(3) supplying to the enclosure a gas consisting essentially of carbon and hydrogen to a pressure sufficient to sustain a plasma, and
simultaneously:
generating a plasma in the gas in said single enclosure, while
applying the surface through capacitive means an electrical potential which changes sign cyclically at time intervals of between $5\times10^{-9}$ and $10^{-6}$ seconds,
whereby the surface is maintained at a net negative potential with respect to the plasma so that positive ions are attracted to the surface during a part of each electrical potential cycle solely by the provision on the surface of the net negative potential resulting in a carbonaceous material being deposited on the surface.

## 4,382,101
## METHOD FOR INCREASING THE PEEL STRENGTH OF METAL-CLAD POLYMERS

Anthony J. Polak, Lake Zurich, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 228,019, Jan. 23, 1981, Pat. No. 4,337,279. This application Feb. 22, 1982, Ser. No. 350,972
Int. Cl.³ B05D 3/06
U.S. Cl. 427—40 6 Claims

1. A process for increasing the peel strength of a metal-clad polyimide polymer which comprises subjecting said polyimide polymer to a carbon tetrafluoride/oxygen gas plasma in an electrical field generated from an electrical power of from about $3.8\times10^{-3}$ watts/cm$^2$ to about 100 watts/cm$^2$ at a temperature of from about ambient to about the glass transition temperature of said polyimide polymer and a pressure in the range of from about 5 atmospheres to about $10^{-6}$ torr for a period of time ranging from about 0.1 minutes to about 4 hours, thereafter depositing a conductive metal on the resultant treated polyimide polymer and recovering the resultant metal-clad polyimide polymer processing increased peel strength.

## 4,382,102
## U.V.-CURABLE COATING COMPOSITION

Arie Noomen, Voorhout, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Filed Oct. 2, 1981, Ser. No. 308,167
Claims priority, application Netherlands, Oct. 7, 1980, 8005533
Int. Cl.³ B05D 3/06
U.S. Cl. 427—54.1 10 Claims

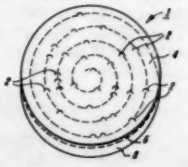
1. A coating composition curable under the influence of ultraviolet light comprising a U.V-curable binder, a photoinitiator, and a nitrogen-containing accelerator, and characterized in that the accelerator is an N,N'-disubstituted cyclic 1,3-diaza compound having 5 to 9 ring atoms.

10. A process for coating a substrate, characterized in that the substrate is provided with a coating composition according to claim 1, and the composition is subjected to radiation having a wave length of 90–600 nm.

## 4,382,103
## MASTER FOR DEVICE REPLICATION

Paul E. McQuaid, Canoga Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 8, 1981, Ser. No. 300,084
Int. Cl.³ B05D 5/06; B29C 3/00, 5/00
U.S. Cl. 427—145 9 Claims



1. A method of device replication comprising:
providing a layer of glass which possesses stored energy in the form of compressive stress,
heating localized portions of a surface of said layer suffi-

ciently to release the compressive stress energy in the form of surface bumps at said localized portions, and utilizing said bumped surface to form at least one mirror image surface copy of said bumped surface.

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**4,382,104**

## METHOD FOR COATING ALUMINA CONTAINING REFRACTORY FIBERS WITH CHROMIUM OXIDE

**Russell D. Smith, Grand Island, N.Y., and Richard E. Tressler, Julian, Pa., assignors to Kennecott Corporation, Stamford, Conn.**

**Continuation of Ser. No. 105,321, Dec. 19, 1980, abandoned, which is a division of Ser. No. 41,033, May 21, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,651**

**Int. Cl.³ B05D *3/02***

**U.S. Cl. 427—226** **7 Claims**

2. A method for uniformly coating ceramic fibers of a fiber mat having a thickness of from 0.5 to 5.0 centimeters with $Cr_2O_3$, said fibers of said mat comprising from about 40 to 100 weight percent aluminum oxide, which method comprises the following sequence of steps:

(1) contacting the fibers of the mat with an aqueous solution containing from about 0.1 to about 7 weight percent of chromium ion;

(2) while said fibers are in contact with said solution, raising the pH of the solution to above about 9.5 to precipitate $Cr_2O_3.xH_2O$ upon the fibers;

(3) vaporizing the remaining water from the fibers; and

(4) heating said fibers to from about 200° to about 1200° C. to convert said $Cr_2O_3.xH_2O$ to $Cr_2O_3$.

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**4,382,105**

## WATER SOLUBLE PENTACHLOROPHENOL AND TETRACHLOROPHENOL WOOD TREATING SYSTEMS CONTAINING FATTY ACID AMINE OXIDES

**Joseph Amundsen, Federal Way; Robert J. Goodwin, Puyallup, and William H. Wetzel, Federal Way, all of Wash., assignors to Reichhold Chemicals, Incorporated, White Plains, N.Y.**

**Division of Ser. No. 297,162, Aug. 28, 1981, Pat. No. 4,357,163, Continuation-in-part of Ser. No. 176,795, Aug. 11, 1980, Pat. No. 4,288,249, which is a continuation of Ser. No. 14,955, Feb. 26, 1979, abandoned, which is a continuation of Ser. No. 875,035, Dec. 2, 1977, abandoned. This application Aug. 18, 1982, Ser. No. 409,150**

**Int. Cl.³ B05D *3/12, 3/02, 1/18***

**U.S. Cl. 427—370** **16 Claims**

1. Method of treating and preserving wooden objects to penetrate and deposit within the wood fibers an essentially non-leachable chlorophenol comprising

I. forming a wood treating and preserving solution by blending (A) from about 0.1% to about 50% by weight of a chlorophenol selected from a group consisting of pentachlorophenol and tetrachlorophenol and mixtures thereof, (B) from about 1% to about 97% by weight of an aliphatic alcohol having from one to six carbon atoms and mixtures thereof, (C) from about 0.2% to about 35% by weight of a fatty acid amine oxide having from about 10 to about 32 carbon atoms (D) from about 1% to about 97% by weight water, and (E) from about 0.2% to about 35% by weight of an amine selected from the group consisting of ammonium hydroxide, triethylamine, trimethylamine, methyl amine and methyldiethanol amine and mixtures thereof;

II. impregnating under heat and pressure the wooden object;

III. Separating said wooden object from said solution; and

IV. drying said treated wooden object.

**4,382,106**

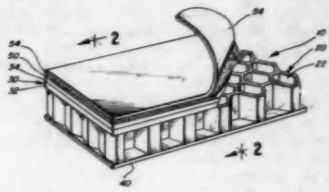
## HONEYCOMB PANEL WITH CONFORMABLE SURFACE

**William V. Royster, Crete, Ill., assignor to International Honeycomb Corporation, Park Forest South, Ill.**

**Filed Sep. 8, 1981, Ser. No. 299,723**

**Int. Cl.³ B32B *3/12***

**U.S. Cl. 428—40** **5 Claims**



1. A self-adhering panel of honeycomb material that is conformable to the shape of an object, comprising:

a central core of honeycomb material having vertically extending columns that define apertures with open ends,

first facing means comprising a paper strip overlying and secured to one end of said columns,

second facing means overlying and secured to the other end of said columns,

a layer of resilient material secured to said paper strip on the side opposite to said honeycomb material and deformable primarily within the thickness thereof to enable it to conform to the shape of said object,

a pressure-sensitive adhesive coating overlying said layer of resilient material and having an exposed surface adapted for use in securing said panel to said object, and a temporary protective means releasably attached to the exposed surface of said pressure-sensitive adhesive coating, and being separable from said pressure-sensitive adhesive coating to make the coating available for use in securing the panel to the object.

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**4,382,107**

## ELECTROGRAPHIC RECORDING MATERIAL

**Irving Serlin, and Donald M. Gardner, both of Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.**

**Filed May 21, 1981, Ser. No. 265,949**

**Int. Cl.³ B32B *7/02*; G01D *15/06, 15/34***

**U.S. Cl. 428—212** **10 Claims**

1. An electrographic recording material comprising a conductive sheet support coated on at least one side with an electrically insulating layer comprising an intimate blend of a polymeric binder and from 200 to 1000 parts by weight of a finely divided non-photoconductive pigment per 100 parts by weight of the polymeric binder, wherein the polymeric binder consists essentially of an interpolymer comprising from about 40 to about 85 parts by weight of monovinyl aromatic monomer units and from about 15 to about 60 parts by weight of units of a $C_3$–$C_7$ allylic alcohol and an ester of a $C_3$–$C_7$ allylic alcohol and a monocarboxylic acid, wherein the mol ratio of monovinyl aromatic units to allylic alcohol and allylic ester units is about 3:1 or less, the mol ratio of allylic ester units to allylic alcohol units is in the range of 0 to about 10, the number average molecular weight of the interpolymer is in the range of about 700 to about 5000 and the glass temperature of the interpolymer is at least about 30° C.

4,382,108

## NOVEL COMPOSITIONS AND PROCESS

Woodrow Carroll, Mont Belvieu, and Thomas R. McClellan, Seabrook, both of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 21, 1981, Ser. No. 332,764
Int. Cl.³ B32B 3/18, 5/16, 5/22
U.S. Cl. 428—326 18 Claims

1. A composite panel comprising:
an inner core layer of scrap plastic in particulate form of a size such that the majority of the particles pass through a 10 U.S. mesh sieve;
said inner core layer being sandwiched between outer layers of particles of cellulosic material capable of being compacted under pressure;
said inner and outer layers and the particles in said layers being bonded together using a binder which comprises an organic polyisocyanate.

13. A process for the preparation of a composite panel according to claim 1 which process comprises the steps of:
coating said particles of cellulosic material and said particles of scrap plastic with said organic polyisocyanate binder;
disposing a first layer of said coated particles of cellulosic material on a rigid mold plate;
disposing a layer of said coated particles of scrap plastic on the upper surface of said first layer;
disposing a second layer of said coated particles of cellulosic material on the upper surface of said layer of coated particles of scrap plastic; and
applying heat and pressure to said assemblage of layers.

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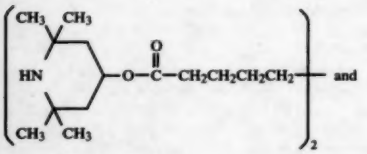
4,382,109

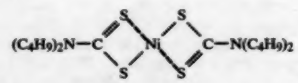
## ABRASION RESISTANT SILICONE COATED THERMOPLASTIC ARTICLE AND METHOD FOR MAKING

Daniel R. Olson, and Ona V. Orkin, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1981, Ser. No. 290,984
Int. Cl.³ B32B 5/16, 27/30
U.S. Cl. 428—331 12 Claims

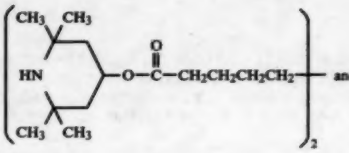
1. Coated articles having improved weather and abrasion resistance comprising
(A) a polycarbonate substrate,
(B) a cured intermediate acrylic primer layer comprising
(1) acrylic polymer and
(2) 5% to 50% by weight of the cured intermediate acrylic primer layer of a mixture of 1 to 10 parts of a UV absorber selected from the class consisting of cyanoacrylate, hydroxybenzophenone and benzotriazole, per part of an organic or organometallic stabilizer selected from the class consisting of

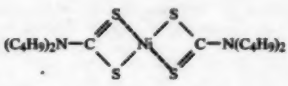



(C) a cured silicone top coat durably adhered to the polycarbonate substrate.

8. A method for making coated polycarbonate articles which comprises,
(1) priming a polycarbonate substrate with an acrylic primer composition comprising acrylic polymer and 5% to 50% by weight based on the weight of acrylic primer composition of a mixture comprising 1 to 10 parts of a UV absorber selected from the class consisting of cyanoacrylate, hydroxybenzophenone and benzotriazole, per part of an organic or organometallic stabilizer selected from the class consisting of




(2) applying a silicone coating composition onto the primed polycarbonate substrate and thereafter effecting the cure of the silicone coating composition to form a hard abrasion resistant coating composition.

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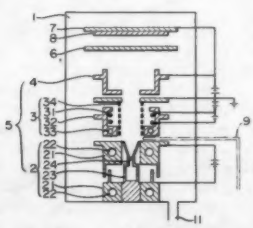
4,382,110

## MAGNETIC RECORDING MEDIUM

Toshinori Takagi, Nagaokakyo; Shinsaku Nakata, Toyonaka; Kazuhiko Kanki, Uji, and Masahiro Hotta, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 124,235, Feb. 25, 1980, Pat. No. 4,354,909.
This application Dec. 11, 1981, Ser. No. 330,019
Claims priority, application Japan, Feb. 23, 1979, 54-20957; Apr. 2, 1979, 54-39685; Apr. 2, 1979, 54-39686
Int. Cl.³ C23C 15/00
U.S. Cl. 428—336 4 Claims

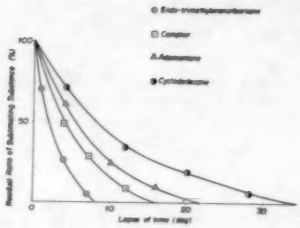



1. A magnetic recording medium comprising a substrate composed of a non-magnetic material and, deposited on the substrate by an ionized cluster beam deposition method, at least one ferromagnetic material selected from the group consisting of cobalt, cobalt-chromium alloy, cobalt-nickel alloy, cobalt-copper alloy, cobalt-iron alloy, cobalt-gold alloy, cobalt-silicon alloy, cobalt-titanium alloy and chromium dioxide.

## 4,382,111
## METHOD OF TREATING FIBER

Hirotsugu Kuwayama, Kusatsu, and Hiroshi Ichikawa, Kisarazu, both of Japan, assignors to Meisei Chemical Works Co., Ltd., Kyoto and Idemitsu Kosan Company Limited, Tokyo, both of, Japan

Filed May 5, 1981, Ser. No. 260,691
Claims priority, application Japan, May 7, 1980, 55/59474; Sep. 11, 1980, 55/125296; Sep. 11, 1980, 55/125297; Feb. 21, 1981, 56/23680; Feb. 21, 1981, 56/23681
Int. Cl.³ D02G 3/100
U.S. Cl. 428—375 13 Claims




7. Yarn composed of fibers and containing between about 0.005 and 5% by weight based on the fibers of at least one sublimable compound selected from the group consisting of endo-trimethylenenorbornane, trimethylnorbornane and cyclododecane, said sublimable compound having been condensed in said fibers from the gas phase and imparting lubricity to said fibers.

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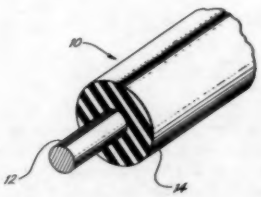
## 4,382,112
## FLEXIBLE INSULATION WITH IMPROVED DISCOLORATION AND HEAT AGE RESISTANCE

Joseph E. Betts, Westport; Joseph E. Vostovich, Bridgeport, both of Conn., and Kenneth R. Curtis, Nashua, N.H., assignors to General Electric Company, New York, N.Y.

Filed Jul. 7, 1981, Ser. No. 280,966
Int. Cl.³ B32B 15/02
U.S. Cl. 428—379 5 Claims



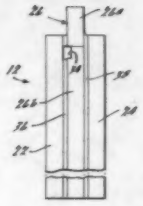

1. A curable composition having improved resistance to discoloration comprising the following combination of ingredients;

| INGREDIENT | PARTS |
|---|---|
| Ethylene-Propylene Polymer | 100 |
| Compatible Chlorinated Polymer | 4–12 |
| Alumina | 50–150 |
| Zinc Oxide | 5–30 |
| Parafin Wax | 0–10 |
| Antioxidant | 2–10 |
| Vinyl Silane Linking Aid | 0.5–3 |
| Peroxide Crosslinking Agent | 1.5–8 |
| Titanium Dioxide | 0–10. |

## 4,382,113
## METHOD FOR JOINING GRAPHITE TO GRAPHITE

Stephan Schwartz, Vaxholm; Olle Ramstrom, Akersberga, and Ake Bjareklint, Vallentuna, all of Sweden, assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Mar. 23, 1981, Ser. No. 246,863
Int. Cl.³ B32B 9/00; H01M 4/00
U.S. Cl. 428—408 17 Claims




1. A method of joining together a plurality of graphite plates providing a low transition resistance, comprising the steps of:
(a) interposing a layer of thermally sensitive plastic material between said graphite plates;
(b) applying a predetermined amount of pressure to said graphite plates forcing said graphite plates together;
(c) applying sufficient heat to said graphite plates to melt said layer of thermally sensitive plastic material;
(d) providing a predetermined period of time for cooling after said layer of thermally sensitive plastic material is melted; and
(e) releasing said application of pressure to said graphite plates.

13. A composite structure, comprising: a plurality of graphite plates bonded together by a layer of thermally sensitive plastic material interposed between said graphite plates, said thermally sensitive plastic material having been melted and joined to said graphite plates by capillary action.

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## 4,382,114
## METHOD OF PRODUCING METAL EFFECT LACQUERINGS AND SHEETS TREATED WITH WEATHER-RESISTANT MULTICOAT METAL EFFECT LACQUERINGS

Peter Höhlein, Kempen; Walter Uerdingen, Leverkusen; Bernd Peltzer, Krefeld, and Gerhard Mennicken, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,878
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010719
Int. Cl.³ B32B 27/40; C08G 18/81, 18/10, 18/70
U.S. Cl. 428—423.1 8 Claims

1. A method of producing metal effect lacquerings with improved weather-resistance by multicoat lacquering of substrates, using a clear lacquer as top coat and a lacquer containing metal pigments for producing the outer layer of the multicoat lacquering which is covered by the layer of clear lacquer, characterized in that the clear lacquer used is one in which the main binder is a two-component system of:
(a) a polyol component consisting essentially of polyester polyols wherein the acid component of the polyester polyol contains not more than about 30% by weight of aromatic carboxylic acids and optionally polyacrylate polyols; and
(b) a polyisocyanate component containing biuret and/or isocyanurate groups as well as cycloaliphatically-bound and/or aliphatically-bound isocyanate groups optionally blocked with blocking agents for isocyanate groups

wherein components (a) and (b) are used in quantities sufficient to provide an NCO:OH equivalent ratio of about 0.8:1 to 2.5:1.

5. A substrate coated with a weather-resistant multilayered metal effect lacquering comprising at least one lacquer layer containing metal pigments and one lacquer top coat, characterized in that the lacquer top coat has been obtained by coating the substrates having a layer containing metal pigments with a clear lacquer and subsequently drying the clear lacquer, the coated substrate being prepared by the method of claim 1.

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## 4,382,115

## FILM COATED WITH SOLUTION CONTAINING A VINYLIDENE CHLORIDE COPOLYMER AND SURFACE ACTIVE AGENT

**Shigeyuki Takahashi, Amagasaki, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan**

**Filed Oct. 16, 1981, Ser. No. 312,069**

**Claims priority, application Japan, Oct. 20, 1980, 55-146494; Sep. 21, 1981, 56-149093**

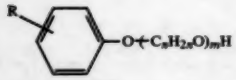
**Int. Cl.³ B32B *27/40***

**U.S. Cl. 428—424.6** **5 Claims**

1. A coated film comprising a film and a coating formed thereon by coating said film with a coating solution consisting essentially of (a) 100 parts by weight of a copolymer of vinylidene chloride and at least one other monomer copolymerizable therewith, said copolymer containing from 85 to 97 mole percent of vinylidene chloride monomer units; (b) from 1.0 to 8.0 parts by weight of an isocyanate compound; (c) from 0.3 to 5.0 parts by weight of at least one member selected from the group consisting of surface active agents of the following formulas (A), (B), (C), (D), (E), (F) and (G):

$$RO(C_nH_{2n}O)_mH \quad (A)$$

wherein R is alkyl or alkenyl having 8 to 20 carbon atoms, m is a number of from 4 to 30, and n is 2 or 3,

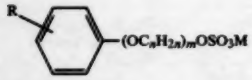


(B)

wherein R is alkyl or alkenyl having 8 to 10 carbon atoms, m is a number of from 4 to 30, and n is 2 or 3,

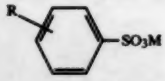
$$R(OC_nH_{2n})_mOSO_3M \quad (C)$$

wherein R is alkyl or alkenyl having 8 to 20 carbon atoms, m is a number of from 4 to 30, n is 2 or 3, and M is Na, K, Ca or $NH_4$,



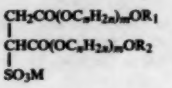
(D)

wherein R is alkyl or alkenyl having 8 to 10 carbon atoms, m is a number of from 4 to 30, n is 2 or 3 and M is Na, K, Ca or $NH_4$,



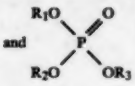
(E)

wherein R is alkyl or alkenyl having 8 to 20 carbon atoms and M is Na, K, Ca or $NH_4$,



(F)

wherein $R_1$ and $R_2$ each is alkyl having 4 to 16 carbon atoms, m is a number of from 0 to 5, n is 2 or 3, and M is Na, K, Ca or $NH_4$,



(G)

wherein $R_1$, $R_2$ and $R_3$ each is alkyl having 1 to 8 carbon atoms or an octylphenyl, nonylphenyl or dodecylphenyl group; and the balance is essentially an organic solvent.

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## 4,382,116

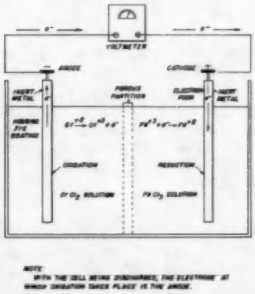
## ZIRCONIUM CARBIDE AS AN ELECTROCATALYST FOR THE CHROMOUS/CHROMIC REDOX COUPLE

**Randall F. Gahn, Columbia Station; Margaret A. Reid, Bay Village, both of Ohio, and Chiang Y. Yang, Ridge, N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed May 22, 1981, Ser. No. 266,255**

**Int. Cl.³ H01M *8/20***

**U.S. Cl. 429—34** **4 Claims**



1. A REDOX cell having first and second chambers separated by an ion permeable membrane;

an anode electrode and the cathode electrode disposed in said first and second chambers, respectively,

means for flowing an anode fluid through the first chamber and

means for flowing a cathode fluid through the second chamber, wherein

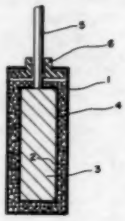
the anode fluid contains water as a solvent having dissolved therein chromium chloride whereby cations in a reduced state are produced and the cathode fluid contains water as a solvent having dissolved therein a chloride salt selected from the group consisting of iron chloride, chromium chloride, vanadium chloride, manganese chloride and cerium chloride whereby cations in an oxidized state are produced, the anode and cathode electrodes being electrically conductive but inert with respect to the anode and cathode fluids, respectively, and

at least one of said electrodes contains zirconium carbide as a catalyst for the electrochemical reaction of the cell.

## 4,382,117
## SEPARATOR FOR ELECTROCHEMICAL HIGH TEMPERATURE CELL

Dieter Kunze, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 73,621, Sep. 10, 1979, abandoned. This application May 1, 1981, Ser. No. 259,429
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847464
Int. Cl.³ H01M 2/18
U.S. Cl. 429—132 15 Claims




1. Separator for electrochemical high temperature cells having a solid positive electrode, a solid negative electrode, and a molten liquid electrolyte which is mainly fixated in the separator, the electrodes being subject to volume changes caused by reaction and thermal expansion, wherein

the separator is formed by an accumulation of particles of ceramic material, said accumulation having been formed by pouring the particles into the previously formed space to be occupied by the separator, thereby producing a coarsely dispersed solid phase capable of absorbing the mechanical loads due to said volume changes.

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## 4,382,118
## ELECTROPHOTOGRAPHIC MEMBER WITH TRANSPORT LAYER HAVING INORGANIC N-TYPE PARTICLES

Kozo Oka, Tokyo, Japan, assignor to Rank Xerox Limited, London, England

Filed Aug. 18, 1981, Ser. No. 293,898
Claims priority, application Japan, Aug. 21, 1980, 55-114049
Int. Cl.³ G03G 5/14, 5/04
U.S. Cl. 430—58 4 Claims

1. An electrophotographic photosensitive member comprising a conductive support, a charge generating layer overlying said conductive support and a charge transporting layer overlying said generating layer, said charge transporting layer being substantially transparent to activating radiation having wavelengths within the spectrally sensitive range to which said generating layer is sensitive and comprising an electrically inactive organic resin binder material having uniformly dispersed therein inorganic n-type semi-conductive particles having a mean particle size below about 0.1 um and capable of supporting the injection of photogenerated electrons from said generating layer and transporting said electrons through said transporting layer.

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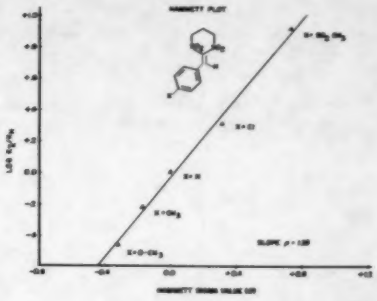
## 4,382,119
## NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

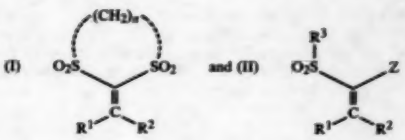
Alan L. Borror, Lexington, and Ernest W. Ellis, Carlisle, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 294,311, Aug. 19, 1981, abandoned. This application May 27, 1982, Ser. No. 382,479
Int. Cl.³ G03C 5/54, 1/48, 5/38
U.S. Cl. 430—212 23 Claims

8. A photographic product which comprises a first sheet-like element comprising a photosensitive silver halide emulsion layer carried on a support, a second sheet-like element adapted to be superposed with said first sheet-like element, means for retaining an aqueous alkaline processing composition for distribution between said first and second sheet-like elements, and a



silver halide solvent precursor disposed in one or both of said sheet-like elements, said silver halide solvent precursor being a compound selected from those represented by the formulae




wherein $R^1$ and $R^2$, the same or different, each are hydrogen, akyl, phenalkyl, phenyl, or phenyl substituted with an electron-donating or electron-withdrawing group; $R^3$ is alkyl, phenalkyl, phenyl, or substituted phenyl; Z is —CN or —$SO_2$—$R^4$ wherein $R^4$ is branched-chain alkyl, phenalkyl, phenyl, or substituted phenyl and n is an integer 3, 4 or 5.

9. A photographic product as defined in claim 8 wherein said silver halide solvent precursor is disposed in said first sheet-like element.

13. A photographic product as defined in claim 9 wherein one of said first and second sheet-like elements additionally includes an image-receiving layer.

14. A photographic product as defined in claim 13 wherein said image-receiving layer is contained in said second sheet-like element.

16. A photographic product as defined in claim 14 wherein said image-receiving layer is a dye image-receiving layer and said first sheet-like element additionally includes a dye image-forming material associated with said silver halide emulsion layer.

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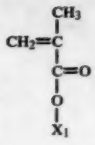
## 4,382,120
## PHOTOSENSITIVE ELEMENT CONTAINING UV SENSITIVE TERPOLYMERS

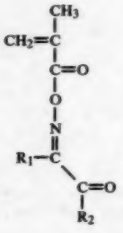
Elsa Reichmanis, Piscataway, and Cletus W. Wilkins, Jr., Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 236,114, Feb. 19, 1981, Pat. No. 4,343,889. This application Feb. 10, 1982, Ser. No. 347,483
Int. Cl.³ G03C 1/68
U.S. Cl. 430—272 10 Claims

1. A photosensitive body comprising a substrate in contact with a photosensitive material comprising an organic polymer characterized in that said polymer is formed from the monomers comprising (1) a methacrylate ester compound represented by the formula



where $X_1$ is an alkyl, (2) a 3-oximino-2-butanone methacrylate based compound represented by the formula



where $R_1$ is chosen from the group consisting of methyl, ethyl, and propyl, $R_2$ is chosen from the group consisting of methyl, ethyl and propyl or $R_1$ and $R_2$ are connected to form a 5 or 6 member ring, and (3) an acrylonitrile based compound represented by the formula

where $X_2$ is $CH_3$ or Cl.

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**4,382,121**

## PRETREATMENT OF GLUCOSE FEEDSTOCK

**Ronald P. Rohrbach, Lake Forest, and Mary J. Maliarik, Lake Forest, both of Ill., assignors to UOP Inc., Des Plaines, Ill.**

**Filed May 8, 1981, Ser. No. 261,995**
**Int. Cl.³ C12P *7/00, 19/24***
**U.S. Cl. 435—94** **9 Claims**

1. In a method of converting glucose to fructose using an immobilized glucose isomerase system, the improvement wherein a feedstock containing glucose and minor amounts of isomerase poisons, prior to contacting with the immobilized glucose isomerase system, is treated with an oxidizing agent selected from the group consisting of peroxides, hypohalites, perhalates, and persulfates at a pH from about 6 to about 9 at a temperature from about 10° to about 80° C. for a time and in an amount effective to increase the productivity of said immobilized glucose isomerase system above that productivity occurring when the enzymatic isomerization is carried out without the presence of said oxidizing agent, the treatment being for a time sufficient to destroy said poisons.

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**4,382,122**

## CALCIUM ASSAY

**Louis M. Mezei, Fremont; Laurence N. Jacobs, Sunnyvale, and Samuel C. Berry, Hayward, all of Calif., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.**

**Filed Oct. 14, 1981, Ser. No. 311,177**
**Int. Cl.³ G01N *33/84***
**U.S. Cl. 436—74** **25 Claims**

20. A method of determining calcium in a liquid sample, said method comprising the steps of:

(a) mixing said sample with a reagent comprising an aqueous solution of a phenolsulphonephthalein dye which contains methylenenitrilo diacetic acid group substituents in the 6 and 6′-positions on the phenol rings and spectrum shifting, noncalcium binding substituents in the 2, 2′ and 5, 5′-positions thereof, and a dye stabilizing amount of a weak acid, to form a reaction mixture;

(b) observing the color change of said reaction mixture; and

(c) comparing said color change to calibration means.

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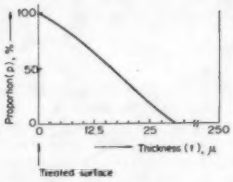
**4,382,123**

## FLUORINATED CATION EXCHANGE MEMBRANE AND PROCESS FOR PREPARING THE SAME

**Kyoji Kimoto, Yokohama; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Yokohama; Mikio Ebisawa, Hiratsuka, and Toshioki Hane, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 152,780, May 23, 1980, Pat. No. 4,332,665.**
**This application Jan. 29, 1982, Ser. No. 344,227**
**Claims priority, application Japan, May 31, 1979, 54-67887**
**Int. Cl.³ B01J *47/12***
**U.S. Cl. 521—27** **4 Claims**




1. In a process for the preparation of a fluorinated cation exchange membrane used for electrolysis comprising treating, with a treating agent selected from the group consisting of an aqueous reducing solution of an inorganic acid, an aqueous reducing solution of an inorganic salt, an aqueous reducing solution of hydrazine, an aqueous reducing solution of an inorganic acid and an inorganic salt, and an aqueous reducing solution of an inorganic salt and hydrazine, one surface of a membrane comprising a fluorocarbon polymer containing pendant groups of the formula (3):

$$-OCF_2CF_2SO_2X \quad (3)$$

wherein each X independently is fluorine, chlorine, bromine, hydrogen, ammonium, a quaternary ammonium or a metal atom,

to convert part of the pendant groups of the formula (3) into pendant groups of the formula (1):

$$-OCF_2COOM \quad (1)$$

wherein each M independently is hydrogen, ammonium, a quaternary ammonium or a metal atom,

said fluorinated cation exchange membrane comprising a fluorocarbon polymer containing pendant carboxylic acid and/or carboxylate groups and pendant sulfonic acid and/or sulfonate groups, the proportion of the density of pendant carboxylic acid and/or carboxylate groups relative to the total density of pendant carboxylic acid and/or carboxylate groups and pendant sulfonic acid and/or sulfonate groups being different between one surface and an internal plane in cross-section parallel to the surfaces of the membrane;

the improvement wherein one surface of a membrane comprising a fluorocarbon polymer containing pendant groups of the formula (3):

$$-OCF_2CF_2SO_2X \quad (3)$$

wherein each X independently is fluorine, chlorine, bromine, hydrogen, ammonium, a quaternary ammonium or a metal atom,

is treated with a treating agent selected from the group consisting of an aqueous reducing solution of at least one inorganic acid, an aqueous reducing solution of at least one inorganic salt, an aqueous reducing solution of hydrazine, an aqueous reducing solution of at least one inorganic acid and at least one inorganic salt, and an aqueous reducing solution of at least one inorganic salt and hydrazine, in the presence of at least one reaction controlling agent selected from the group consisting of $C_1$–$C_{12}$ carboxylic acids, $C_1$–$C_{12}$ sulfonic acids, $C_1$–$C_{12}$ alcohols, $C_1$–$C_{12}$ nitriles and $C_2$–$C_{12}$ ethers, provided that when the treating agent includes hydrazine, said at least one reaction controlling agent is selected from $C_1$–$C_{12}$ alcohols, $C_1$–$C_{12}$ nitriles and $C_2$–$C_{12}$ ethers, thereby to prepare a fluorinated cation exchange membrane

which comprises a fluorocarbon polymer containing pendant groups of the formula (1):

$$-OCF_2COOM \quad (1)$$

wherein each M independently is hydrogen, ammonium, a quaternary ammonium or a metal atom,

and pendant groups of the formula (2):

$$-OCF_2CF_2SO_3M \quad (2)$$

wherein each M independently is as defined above, and wherein the proportion (p) represented by the equation (a):

$$p = A/(A+B) \times 100(\%) \quad (a)$$

wherein A is the density of pendant groups of the formula (1) and B is the density of pendant groups of the formula (2),

is at least 20% in one surface of the membrane, and said proportion (p) gradually decreases from the one surface to the other surface or to that plane within the membrane where A reaches zero, said proportion (p) and a thickness (t) in microns between the one surface and the other surface or a plane within the membrane in cross-section parallel to the surfaces of the membrane satisfying the following inequality (b):

$$|\Delta p/\Delta t| = 12(\%/\mu) \quad (b).$$

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**4,382,124**

## PROCESS FOR PREPARING MACRORETICULAR RESINS, COPOLYMERS AND PRODUCTS OF SAID PROCESS

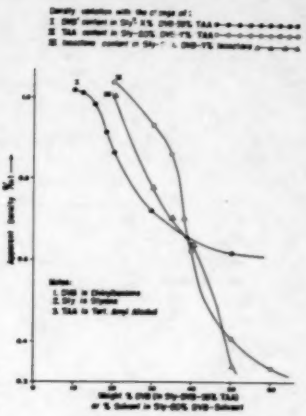
**Erich F. Meitzner, Glenside, and James A. Oline, Wyncote, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 749,526, Jul. 18, 1958, Pat. No. 4,224,415. This application Jun. 3, 1980, Ser. No. 156,004**

**Int. Cl.³ C08F 2/18; B01J 41/14**

**U.S. Cl. 521—38** **10 Claims**

1. A process for preparing reticular crosslinked copolymer beads of high specific surface having controlled reduced apparent density of at least about 0.02 density units less than the apparent density of gel-type copolymer beads of the same composition made in absence of liquid precipitant, which comprises suspension copolymerizing in an aqueous medium (1) a polyvinylidene monomer containing a plurality of ethylenically unsaturated groups in non-conjugated relationship and (2) a monovinyl aromatic hydrocarbon monomer in a liquid precipitant which (a) has a low solubility in the aqueous medium, (b) is a solvent for the monomer mixture and (c) does not appreciably swell the copolymer of said polyvinylidene monomer and said monovinyl aromatic hydrocarbon monomer, said liquid precipitant and said polyvinylidene monomer each being present in an amount exceeding the critical concentration of each needed for phase separation of the copolymer from the



monomer phase as the copolymer is formed, and recovering the copolymer beads so formed.

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**4,382,125**

## ISOCYANURATE-MODIFIED POLYMETHYLENE POLYPHENYLENE POLYISOCYANATE COMPOSITIONS

**Thirumurti Narayan, Grosse Ile; Peter T. Kan, Plymouth, and John T. Patton, Jr., Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

**Filed Nov. 30, 1981, Ser. No. 325,684**

**Int. Cl.³ C08G 18/14**

**U.S. Cl. 521—160** **2 Claims**

1. A polyurethane isocyanurate foam prepared by reacting: (a) an isocyanurate-modified polyisocyanate containing a mixture of 45 to 70 percent by weight diphenylmethane diisocyanate, an organic polyisocyanate mixture of 45 to 70 percent by weight of diphenylmethane diisocyanate having an isomer mixture of 40 to 100 weight percent 4,4'-, 0 to 50 weight percent 2,4-, and 0 to 10 weight percent 2,2'- diphenylmethane diisocyanate and from 30 to 55 percent by weight polymethylene polyphenylene polyisocyanate, to the extent that the conversion to isocyanurate based on the NCO content is from about 20 to 33 percent by weight and a Brookfield viscosity from 1,000 to 100,000 centipoises at 25° C., and (b) an active hydrogen compound selected from the group consisting of diethylene glycol and ethylene oxide adducts of trimethylolpropane, trimethylolethane and glycerine, in the presence of blowing agents, surfactants and optionally crosslinking agents.

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**4,382,126**

## PREPARATION OF AQUEOUS COATING COMPOSITION COMPRISING POLYIMIDE-FORMING REACTANTS

**Edith M. Boldebuck, Schenectady, N.Y., and Eugene G. Banucci, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.**

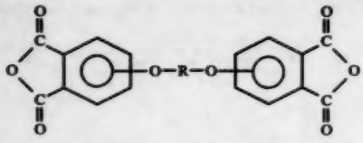
**Division of Ser. No. 124,986, Feb. 27, 1980, Pat. No. 4,332,708. This application Jan. 18, 1982, Ser. No. 339,953**

**Int. Cl.³ C08L 79/08**

**U.S. Cl. 524—376** **7 Claims**

1. A method for making a wire coating composition in the form of a stable aqueous solution comprising

(1) heating a mixture of an organic dianhydride of the formula,



monoalkyl ether of ethylene glycol or diethylene glycol and water at a temperature of 70° C. to 135° C. where there is utilized in the mixture from about 0.35 to about 2.5 parts of monoalkyl glycol ether and about 0.05 to about 0.4 part of water, per part of dianhydride, to form a clear solution,

(2) adding to the solution of (1) about an equal molar amount and up to 25 mole percent excess, based on moles of organic dianhydride of (1), and organic diamine of the formula,

$$H_2NR^1NH_2,$$

where R is a $C_{(6-30)}$ aromatic organic radical and $R^1$ is a $C_{(6-30)}$ organic radical.

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**4,382,127**

## PROCESS FOR THE PREPARATION OF SUSPENSIONS OF POLYMERS; SUSPENSIONS OF SAID POLYMERS; AND USES OF SAID SUSPENSIONS

**Bruno Claude, Montivilliers; Jean-Jacques Labaig, Le Havre, and Christian Martinez, Harfleur, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France**

**Filed Sep. 3, 1981, Ser. No. 299,210**

**Claims priority, application France, Sep. 9, 1980, 80 19404**

**Int. Cl.³ C08F 6/00, 6/24; C08J 3/08; C08L 23/04**

**U.S. Cl. 524—504** **7 Claims**

1. A process for the preparation of stable suspensions with higher concentrations of solid polymer particles, comprising preparing a first suspension of at least one polymer in an organic liquid by chilling a solution of said polymer, and then adding a powder of at least one polymer, which may be the same as or different from the first polymer, to said first polymer suspension to achieve a stable final suspension having a concentration greater than would normally be achieved by the first step alone and also greater than normally could be achieved by direct suspension of said powder in said organic liquid.

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**4,382,128**

## POLYOLEFIN GRAFTED WITH POLYCARBOXYLIC ACID, ESTER OR ANHYDRIDE AND MODIFIED WITH POLYHYDROXY COMPOUND

**George S. Li, Macedonia, Ohio, assignor to Standard Oil Company, Cleveland, Ohio**

**Continuation-in-part of Ser. No. 172,896, Jul. 28, 1980, abandoned. This application May 11, 1981, Ser. No. 262,769**

**Int. Cl.³ C08F 255/02; C08L 23/06**

**U.S. Cl. 524—513** **18 Claims**

1. A method of preparing polyolefin compositions having improved properties which comprises reacting

(a) a graft-modified polyolefin obtained by reacting a polyolefin with an unsaturated polycarboxylic acid, ester or anhydride which is graft-polymerizable therewith, and

(b) at least one organic polyhydroxy compound, the molar ratio of said organic polyhydroxy compound to unreacted unsaturated polycarboxylic acid, ester or anhydride in (a) being at least 5:1.

**4,382,129**

## DICYANDIAMIDE-FORMALDEHYDE CONDENSATES MODIFIED WITH ACRYLAMIDE AND PROCESS FOR PREPARING THE SAME

**Ralph A. Bankert, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Dec. 8, 1981, Ser. No. 328,752**

**Int. Cl.³ C08L 61/22**

**U.S. Cl. 524—598** **13 Claims**

1. A process for preparing improved water-soluble thermosettable resinous compositions containing dicyandiamide-formaldehyde condensates which process comprises (1) forming a precondensate solution by refluxing for about 1 to about 4 hours an aqueous mixture of (a) a base reaction product of 1 mole of dicyandiamide, 0.75 mole to 1.5 moles of formaldehyde and an acid salt of a water-soluble polyaminopolyamide in an amount sufficient to provide from about 0.125 to about 0.5 equivalent of basic nitrogen and (b) an ammonium salt in an amount such that there will be from 0.7 equivalent to about 1.2 equivalents of basic nitrogen derived from the salt of the polyaminopolyamide and the ammonium salt in the aqueous medium, (2) adding to the precondensate solution from 0.30 to 0.45 mole of acrylamide per equivalent of basic nitrogen derived from the salt of the polyaminopolyamide and the ammonium salt, and heating the aqueous mixture at about 80° to about 110° C. for about 0.5 to about 1.5 hours until a solution of modified precondensate is formed, (3) adding from about 1.25 to about 3.75 moles of formaldehyde to the aqueous solution of modified precondensate and (4) heating the resulting mixture of about 60° to about 100° C. until the viscosity of an aqueous solution of the resulting reaction product at a solids content of 50% is from about U to Z on the Gardner-Holdt scale.

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**4,382,130**

## MOISTURE CURABLE COMPOSITIONS AND ARYLOXYPHOSPHONIUM SALTS

**Robert H. Ellison, Schenectady, and Martin A. Byrne, Troy, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 143,821, Apr. 25, 1980, Pat. No. 4,341,714. This application Oct. 14, 1981, Ser. No. 311,126**

**Int. Cl.³ C08G 59/68, 8/10; C08F 4/72, 4/00**

**U.S. Cl. 525—337** **7 Claims**

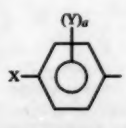
1. Moisture curable compositions which comprises,

(A) a cationically polymerizable organic material and

(B) an effective amount of an aryloxyphosphonium salt of the formula,

$$[(RO\rightarrow)_n(R^1\rightarrow)_{4-n}P]^+[MQ_d]^-$$

where R and $R^1$ are monovalent aryl radicals selected from $C_{(6-13)}$ hydrocarbon radicals and radicals of the formula,



where X is selected from $C_{(1-8)}$ alkoxy, nitrile, acyloxy, halogen and nitro, Y is selected from hydrogen, $C_{(1-8)}$ alkyl and X radicals, and $C_{(6-13)}$ halogenated monovalent hydrocarbon radicals, M is selected from B, As, Sb and P, Q is a halogen radical, a is a whole number equal to 0 to 4 inclusive, d is an integer equal to 4–6 inclusive and n is an integer equal to 1 to 4 inclusive.

## 4,382,131
## THERMOPLASTIC BLOCK COPOLYESTERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE FOR THE PRODUCTION OF MOULDINGS

Rudolf Binsack; Karl-Heinz Köhler, both of Krefeld; Leo Morbitzer, Cologne; Ladwig Bottenbruch, Krefeld, and Walter Heitz, Kirchhain, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,175

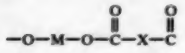
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047990

Int. Cl.³ C08F 283/00, 283/02

U.S. Cl. 525—445 10 Claims

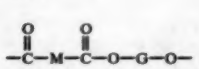
1. Block copolyesters having a relative viscosity (as measured in phenol/o-dichlorobenzene, ratio by weight 1:1—at 25° C.) of from 1.15 to 3.0 and, disregarding the terminal groups, consisting of:

(A) from 1 to 60% by weight, based on the block copolyester, a long-chain units corresponding to the following formula



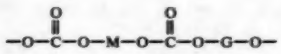
(Ia)

and/or



(Ib)

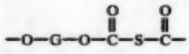
and/or



(Ic)

and

(B) from 40 to 99% by weight, based on the block copolyester, of short-chain units corresponding to the following formula



(II)

characterised in that

M is a difunctional polymethylene radical containing terminal bonding sites and having an average molecular weight $\overline{M}_n$ of from 400 to 5000; any side chains present must be methyl and/or ethyl groups and the polydiene radical on which the polymethylene residue is based contains at least 50 mole percent of 1,4-bonds,

G is a difunctional aliphatic radical containing from 1 to 12 carbon atoms and/or a difunctional cycloaliphatic radical containing from 6 to 12 carbon atoms and having a molecular weight below 300, at least 70 mole percent of G consisting of one and the same radical,

X is a direct bond or a difunctional aliphatic, cycloaliphatic and/or aromatic radical containing from 1 to 14 carbon atoms and having a molecular weight below 300, at least 70 mole percent of X consisting of 1,4-phenylene radicals.

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## 4,382,132
## HIGH PRESSURE POLYETHYLENE PROCESS

Joseph M. Kelley, Westfield, and John J. Roderick, Wyckoff, both of N.J., assignors to El Paso Polyolefins Company, Paramus, N.J.

Filed Jun. 1, 1981, Ser. No. 269,302

Int. Cl.³ C08F 4/06, 4/26

U.S. Cl. 526—145 15 Claims

1. A process for the polymerization of ethylene which comprises

continuously introducing ethylene to a reaction zone maintained at a pressure of at least 20,000 psi and contacting the ethylene with an initiator solution containing

(a) at least one free radical generating polymerization initiator

(b) from about 0.1 to about 2.0 weight percent based on the initiator weight of an accelerator selected from the group consisting of metal complexes with beta-ketones and organometallic salts and

(c) from about 0.1 to about 2.0 weight percent based on the initiators weight of a coaccelerator selected from the group consisting of amines, distearyl thiodipropionate, dilauryl thiodipropionate, isooctyl thiodipropionate, ditridecyl thiodipropionate, isooctyl thioglycolate, n-dodecyl mercaptan, n-octyl mercaptan, n-lauryl mercaptan, decyl diphenyl phosphite and triphenylphosphite

and recovering a solid ethylene polymer as a product of the process.

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## 4,382,133
## PEROXYGEN COMPOUND-6-O-ALKANOYLISOASCORBIC ACID REDOX CATALYST SYSTEM FOR SUSPENSION POLYMERIZATION OF VINYL CHLORIDE

Norman G. Gaylord, New Providence, N.J., assignor to Dart Industries Inc., Northbrook, Ill.

Filed May 4, 1981, Ser. No. 260,438

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ C08F 4/40, 14/06

U.S. Cl. 526—204 9 Claims

1. A process for the preparation of polymers and copolymers of vinyl chloride, which consists in suspension polymerization in the presence of a redox catalyst system consisting of a peroxygen compound selected from the class consisting of peroxyesters and diacyl peroxides, and a 6-O-alkanoylisoascorbic acid as a reducing agent.

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## 4,382,134
## 3-SUBSTITUTED-7-ALKOXY-SPIRO(2H-1-BENZOPYRAN-2,3'-(3H)-NAPHTHO(2,1-B)PYRANS)

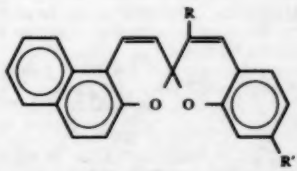
John E. Herweh, Lancaster; Thomas B. Garrett, Lititz, and Alan B. Magnusson, Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Oct. 22, 1981, Ser. No. 313,732

Int. Cl.³ C08F 234/02; C07D 311/96

U.S. Cl. 526—268 4 Claims

1. A spiropyran compound having the formula



wherein R represents alkylene aryl, aryl, unsaturated alkyl or cycloalkyl and R' is alkoxy.

2. The compound of claim 1 wherein R is unsaturated alkyl.

3. The compound of claim 2 which is 3-allyl-7-methoxy-2,2'-spiro(2H-1-benzopyran-2,3'-(3H)-naphtho (2,1-b)pyran).

4. A copolymer produced by the free radical polymerization of a spiropyran compound of claim 2 and an acryate of the formula

wherein X is H or $CH_3$ and X' is H or a straight or branched alkyl group having from 1 to 12 carbon atoms.

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**4,382,135**

**RADIATION-HARDENABLE DILUENTS**

**Joseph V. Sinka, Mendham; Francis A. Higbie, Bound Brook, and Robert A. LieBerman, Hopatcong, all of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.**

**Filed Apr. 1, 1981, Ser. No. 250,058**

**Int. Cl.³ C07C *69/54;* C08F *226/00***

**U.S. Cl. 526—301** **16 Claims**

1. Diacrylates of the reaction product of neopentyl glycol with from about 2 to about 6 moles of ethylene oxide.

2. Diacrylates of the reaction product of neopentyl glycol with from about 2 to about 4 moles of propylene oxide.

8. A radiation-hardenable composition comprising a radiation-hardenable oligomer and a radiation-hardenable diluent which is a diacrylate of the reaction product of neopentyl glycol with from about 2 to about 6 moles of ethylene oxide.

9. A radiation-hardenable composition comprising a radiation-hardenable oligomer and a radiation-hardenable diluent which is a diacrylate of the reaction product of neopentyl glycol with from about 2 to about 4 moles of propylene oxide.

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**4,382,136**

**PROCESS FOR THE PRODUCTION OF POLYHYDROXY LIGNIN-CELLULOSE SILICATE POLYMER**

**David H. Blount, 5450 Lea St., San Diego, Calif. 92105**

**Continuation-in-part of Ser. No. 306,184, Sep. 28, 1981, Pat. No. 4,367,326, which is a continuation-in-part of Ser. No. 257,126, Apr. 24, 1981, Pat. No. 4,313,857, which is a continuation-in-part of Ser. No. 203,730, Nov. 3, 1980, Pat. No. 4,243,757, which is a continuation-in-part of Ser. No. 112,290, Jan. 15, 1980, which is a continuation-in-part of Ser. No. 29,282, Apr. 12, 1979, Pat. No. 4,220,757. This application Apr. 27, 1982, Ser. No. 372,298**

**Int. Cl.³ C08L *1/00***

**U.S. Cl. 527—305** **10 Claims**

1. The process for the production of polyhydroxy lignin-cellulose silicate polymers by mixing and reacting the following components:

(a) a broken-down alkali metal plant silicate polymer produced by heating a mixture of 3 parts by weight of a lignin cellulose-containing plant and 1 to 2 parts by weight of an oxidated silicon compound with 2 to 5 parts by weight of a melted alkali metal hydroxide to between 150° C. and 220° C. while agitating for 5 to 60 minutes; in an amount of 100 parts by weight;

(b) an epoxide compound selected from the group consisting of alkylene oxide, epihalohydrins, styrene oxide, tetrahydrofuran and mixtures thereof; in an amount of 1 to 300 parts by weight;

(c) a Lewis acid; in an amount wherein the pH of the mixture of Components (a), (b) and (c) is 5 to 6.

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**4,382,137**

**MOLDED RESIN PRODUCT AND PROCESS FOR PRODUCING SAME**

**Johann G. Schulz, Pittsburgh; Walter P. Barie, Jr., Glenshaw, and James T. Eurich, Marwood, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Feb. 9, 1981, Ser. No. 232,996**

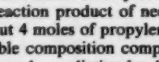
**Int. Cl.³ C08G *63/12***

**U.S. Cl. 527—500** **10 Claims**

1. A process for preparing a molded resin product which comprises forming a curable mixture consisting essentially of

(a) a mixture of substantially water insoluble polycyclic, aromatic, polycarboxylic acids prepared by subjecting a water slurry of coal to reaction with aqueous nitric acid having a concentration of from about 5% to about 90% by weight at a temperature of about 15° to about 200° C. for about 0.5 to about 15 hours,

(b) one or more polyols defined by the formula



wherein x is a number from 1 to 5 and R is an organic bifunctional radical selected from the group consisting of aliphatic, cycloaliphatic and carbocyclic radicals having from 2 to 10 carbon atoms, and

(c) an effective amount of suitable acid catalyst capable of producing and maintaining a reaction between (a) and (b), wherein

the acid/hydroxy ratio of said curable mixture is in the range from about 0.5 to about 3.0;

subjecting said curable mixture at non-molding pressure conditions to a temperature in the range between 80° to about 150° C. for at least about 15 minutes to about 4.0 hours; and, thereafter

molding said curable mixture at a temperature of from about 170° to about 220° C., and a pressure of about 200 lb about 20,000 psi gauge.

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**4,382,138**

**POLYAMIDE CONTAINING 4,4'-DIAMINO-2,2', 6,6'-TETRAMETHYLBIPHENYL MOIETIES**

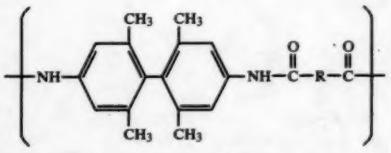
**Edward E. Paschke, Wheaton, and J. A. Donohue, Elmhurst, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Sep. 28, 1981, Ser. No. 305,931**

**Int. Cl.³ C08G *69/32***

**U.S. Cl. 528—347** **64 Claims**

1. An injection moldable polyamide comprising the following recurring structure:



wherein R is a divalent aliphatic or aromatic hydrocarbon radical or a mixture of hydrocarbon radicals and the polyamide has a glass transition temperature in excess of 171° C.

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**4,382,139**

**PROCESS AND APPARATUS FOR CONTINUOUS PRODUCTION OF POLYESTERS**

**Friedhelm Kapteina, Gelsenkirchen, and Jürgen Rink, Hattingen, both of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany**

**Filed Dec. 10, 1981, Ser. No. 329,619**

**Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047474**

**Int. Cl.³ C08G *63/70***

**U.S. Cl. 528—502** **9 Claims**

1. In a process for continuous production of a polyester which comprises reacting (A) normally solid terephthalic acid with (B) normally liquid ethylene glycol, to produce a low molecular weight bis-β-hydroxyethylene terephthalate, subjecting said bis-β-hydroxyethylene terephthalate to precondensation under reduced pressure to produce an intermediate ethylene terephthalate product of increased molecular weight, and subjecting said intermediate product of polycondensation under further reduced pressure to increase the molecular

weight of the intermediate product and thus produce polyethylene terephthalate, the improvement which comprises

subjecting a mixture containing solid starting material (A) and liquid starting material (B) to the shearing and homogenizing action of a rotor-stator comprising rows of teeth and holes arranged in a ring-shape on the rotor and stator to form a series of shearing gaps, wherein said mixture is axially sucked into said rotor, subjected to shearing and homogenizing action in said rotor-stator to increase the surface area of said starting material (A), and to produce a homogeneous mixture containing (A) and (B), and then said homogeneous mixture is radially ejected from said stator, and

introducing said homogeneous mixture into a thin-layer evaporator wherein said starting materials (A) and (B) are reacted with each other to produce a reaction mixture containing said low molecular weight bis-$\beta$-hydroxyethylene ester.

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**4,382,140**

**2,4-DIPHENYL-5-PYRIMIDINECARBONITRILE**

**Thomas J. Schwan, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.**

**Filed Jan. 26, 1982, Ser. No. 342,739**

**Int. Cl.³ C07D *237/24;* A61K *31/505***

**U.S. Cl. 544—242** **1 Claim**

1. The compound 2,4-diphenyl-5-pyrimidinecarbonitrile.

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**4,382,141**

**CIS- AND TRANS-4-(4-BROMOPHENOXY)-1-[6-FLUORO-1,2-BENZISOXAZOLE-3-YL)PROPYL]-3-PHENYLPIPERIDINES**

**Solomon S. Klioze, Flemington, and Frederick J. Ehrgott, Bernardsville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Bridgewater, N.J.**

**Division of Ser. No. 117,532. Feb. 19, 1980, Pat. No. 4,312,876, which is a continuation-in-part of Ser. No. 14,548, Feb. 23, 1979, Pat. No. 4,216,218. This application Oct. 2, 1981, Ser. No. 307,719**

**Int. Cl.³ C07D *413/06***

**U.S. Cl. 546—198** **2 Claims**

1. Trans-4-(4-bromophenoxy)-1-[6-fluoro-1,2-benzisoxazole-3-yl)propyl]-3-phenylpiperidine, or a physiologically acceptable salt thereof.

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**4,382,142**

**THIADIAZOLE DERIVATIVES AND PROCESS FOR PREPARING SAME**

**Kichitaro Takatori, Nagoya; Takashi Yamaguchi, Urawa, and Masahiko Nagakura, Sayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan**

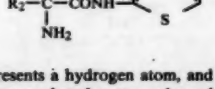
**Filed Nov. 3, 1980, Ser. No. 203,152**

**Claims priority, application Japan, Oct. 18, 1978, 53-128146**

**Int. Cl.³ C07D *285/12;* A61K *31/425***

**U.S. Cl. 548—139** **3 Claims**

1. A compound represented by the formula,



wherein $R_1$ represents a hydrogen atom, and $R_2$ represents a lower alkyl group, a phenyl group, a benzyl group, a lower alkylthio lower alkyl group, a lower alkyl group substituted by a carboxyl or hydroxyl group, or a 3-indolymethyl group, or wherein $R_1$ and $R_2$ define in combination a $C_4$-alkylene group, or a pharmaceutically acceptable acid addition salt thereof.

**4,382,143**

**HYPOLIPIDEMIC AND ANTIATHEROSCLEROTIC NOVEL (MONOSUBSTITUTED-AMINO)HETEROARYL CARBOXYLIC ACIDS AND ANALOGS**

**Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Jul. 23, 1979, Ser. No. 60,251**

**Int. Cl.³ C07D *333/40, 333/38***

**U.S. Cl. 549—68** **1 Claim**

1. The compound 5-(10-undecenylamino)-2-thiophenecarboxylic acid.

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**4,382,144**

**SYNTHESIS OF ARYLENE BIS-SILANOLS**

**Harold Rosenberg, and Tsu-tzu Tsai, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jan. 27, 1982, Ser. No. 342,988**

**Int. Cl.³ C07F *7/08***

**U.S. Cl. 556—440** **3 Claims**

1. Bis(3-hydroxydimethylsilylphenyl)carbonate having a melting point of 94°–95° C.

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**4,382,145**

**METHOD OF HYDROLYZING ORGANOCHLOROSILANES**

**Yaw D. Yeboah, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 2, 1981, Ser. No. 298,663**

**Int. Cl.³ C07F *7/08***

**U.S. Cl. 556—460** **5 Claims**

1. In the method of hydrolyzing organochlorosilane of the formula

$$R_{(a)}H_{(b)}SiX_{(4-a-b)},$$

in a hydrolysis reactor, where R is selected from $C_{(1-13)}$ monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals and X is a halogen radical, utilizing a substantially stoichiometric equivalent of organohalosilane and water required for such organohalosilane hydrolysis, resulting in organopolysiloxane hydrolyzate having greater than about 5% by weight, based on the weight of organopolysiloxane hydrolyzate, of halogen radicals in the form of dissolved HX or terminal—SiX groups as a result of the recycling of aqueous HX to the hydrolysis reactor, whereby a loss of halide values results upon the neutralization of the organopolysiloxane hydrolyzate with base, to reduce its acidity, the improvement which comprises, utilizing as the source of water for the organochlorosilane hydrolysis, an aqueous hydrochloric acid solution having at least 35% by weight of hydrogen chloride which is utilized in an amount sufficient to provide a ratio of moles of water to moles of organochlorosilane having a value of from about 10 to about 30, whereby a substantial reduction in the weight percent of chemically combined halogen radicals, based on the weight of organopolysiloxane hydrolyzate is effected and improved yields of organocyclopolysiloxane is achieved.

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**4,382,146**

**ORGANIC ACIDS AND PROCESS FOR PREPARING SAME**

**Johann G. D. Schulz, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 910,215, May 30, 1978, Pat. No. 4,334,084. This application Mar. 11, 1982, Ser. No. 356,960**

**Int. Cl.³ C07C *51/373, 51/47***

**U.S. Cl. 562—410** **8 Claims**

1. In a process for preparing a mixture of polycyclic, aromatic polycarboxylic acids carrying nuclear nitro groups that is soluble in a mixture consisting essentially of methyl ethyl ketone and ethanol but substantially insoluble in water which

consists essentially in subjecting a slurry containing coal to reaction with aqueous nitric acid having a concentration of about 5 to about 90 percent at a temperature of about 15° to about 200° C. for about 0.5 to about 15 hours and mechanically separating the solids in the resulting slurry, the improvement which consists essentially in extracting said separated solids with a mixture consisting essentially of methyl ethyl ketone and ethanol in amounts sufficient to form an azeotropic mixture and then separating said methyl ethyl ketone and said ethanol from the extract to obtain said mixture of polycyclic, aromatic polycarboxylic acids.

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**4,382,147**

**PROCESS FOR ISOLATING 4,4-DIHYDROXYDIPHENYL SULFONE FROM A MIXTURE OF DIHYDROXYDIPHENYLSULFONE ISOMERS**

**Hirotsugu Kitamura; Yasumasa Shimizu, and Osami Ohura, all of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Japan**

**Filed Sep. 9, 1981, Ser. No. 300,502**

**Claims priority, application Japan, Oct. 31, 1980, 55-152228**

**Int. Cl.³ C07C *147/10***

**U.S. Cl. 568—33** **5 Claims**

1. A process for isolating 4,4'-dihydroxydiphenyl sulfone from a mixture of dihydroxydiphenyl sulfone isomers, which process consists essentially of heat dissolving in phenol and water an isomer mixture consisting of 4,4'-dihydroxydiphenyl sulfone and 2,4'-dihydroxydiphenyl sulfone and then cooling the resulting solution thereby allowing 4,4'-dihydroxydiphenyl sulfone to precipitate as an adduct with phenol wherein the water is present in an amount less than 20% by weight based on the amount of phenol, the dissolving of said isomer mixture is performed at about 60° C. to about 100° C., and the cooling of the resulting solution is performed at a temperature lower than about 50° C.

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**4,382,148**

**PROCESS FOR THE PREPARATION OF GLYCOL ALDEHYDE**

**Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.**

**Filed Oct. 27, 1981, Ser. No. 315,681**

**Claims priority, application United Kingdom, Mar. 24, 1981, 8109119**

**Int. Cl.³ C07C *45/49***

**U.S. Cl. 568—462** **8 Claims**

1. A process for the preparation of glycol aldehyde, which comprises reacting formaldehyde with hydrogen and carbon monoxide at a temperature in the range of from about 30° C. to about 200° C. and at a pressure in the range of from about 5 to about 200 bars, in the presence of a catalyst system derived from a rhodium-containing catalyst precursor and/or a cobalt-containing catalyst precursor together with a strong protonic acid.

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**4,382,149**

**SUPPORTED SILVER CATALYST**

**Bruno O. Krueger, Springfield, Oreg., assignor to Borden, Inc., Columbus, Ohio**

**Division of Ser. No. 204,153, Nov. 5, 1980. This application Feb. 12, 1982, Ser. No. 348,660**

**Int. Cl.³ C07C *47/052***

**U.S. Cl. 568—473** **3 Claims**

1. In a process for the production of formaldehyde by oxidative dehydrogenation of methanol with oxygen gas in the presence of a supported silver catalyst at elevated temperature, the improvement which comprises carrying out the reaction by contacting the reacting methanol and oxygen gasses with a supported silver catalyst prepared by;

(a) contacting an inert porous carrier having a particle size of about 0.5 to 2.0 millimeters long and about 0.4 to 0.6 millimeters in diameter said carrier having a tap volume of about 1.3 to 1.8 grams per cubic centimeter with water or another liquid soluble in water and having a boiling point of less than about 105° C. in an amount sufficient to wet said carrier and to enter the porous structure thereof;

(b) contacting the wet carrier with an ammoniated aqueous solution of a silver salt in an amount sufficient to coat said carrier with form about 2% to about 8% of metallic silver in said salt form, said solution also containing a minor amount of a fatty acid;

(c) drying the coated carrier; and

(d) heating the dry carrier at a temperature sufficient to decompose the silver compounds and obtain a metallic silver coating which is adherent to the periphery of said carrier in a quantity of from about 1% to 10% by weight of said carrier and wherein the penetration of the silver within said carrier being no greater than about 15% of the thickness of said carrier.

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**4,382,150**

**METHOD FOR HYDROGENATING AQUEOUS SOLUTIONS OF CARBOHYDRATES**

**Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Jan. 19, 1982, Ser. No. 340,614**

**Int. Cl.³ C07C *31/18, 31/24, 31/26***

**U.S. Cl. 568—863** **10 Claims**

1. A method for the hydrogenation of a carbohydrate in aqueous solution to its polyols comprising contacting at hydrogenation conditions a reaction medium consisting essentially of said solution with hydrogen and a catalyst consisting essentially of nickel dispersed on titanium dioxide, and recovering the formed polyols.

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**4,382,151**

**6,10,14,18-TETRAMETHYL-5,9,13,17-NONADECA-TETRAENE-2-OL**

**Isao Yamatsu, Kawaguchi; Yuichi Inai; Shinya Abe, both of Tokyo; Takeshi Suzuki, Abiko; Toshiharu Ohgoh, Kounan; Manabu Murakami, Kakamigahara; Kiyoshi Oketani, and Hideaki Fujisaki, both of Takehayamachi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan**

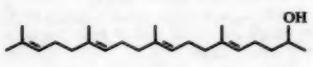
**Filed Aug. 27, 1981, Ser. No. 296,728**

**Claims priority, application Japan, Aug. 29, 1980, 55-118452**

**Int. Cl.³ C07L *33/02***

**U.S. Cl. 568—875** **3 Claims**

1. 6,10,14,18-Tetramethyl-5,9,13,17-nonadecatetraene-2-ols of the formula:

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**4,382,152**

**PROCESS FOR THE CONVERSION OF TERPENES TO CYMENES**

**Lawson G. Wideman, Tallmadge, and Joseph A. Kuczkowski, Munroe Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Oct. 14, 1981, Ser. No. 311,220**

**Int. Cl.³ C07C *5/36, 15/02***

**U.S. Cl. 585—430** **30 Claims**

1. A process for the conversion of terpenes to cymenes which comprises contacting at least one terpene selected from the group comprised of mono- and bi-cyclic unsaturated hydrocarbons having the formula $C_{10}H_{16}$, with an alkali metal carbonate catalyst on a support at a temperature of 300° to 475° C.

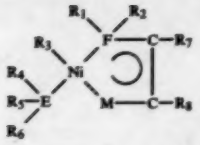
4,382,153

## PROCESS FOR THE OLIGOMERIZATION OF ETHYLENE IN METHANOL

David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 5, 1982, Ser. No. 365,291
The portion of the term of this patent subsequent to Jan. 12, 1998, has been disclaimed.
Int. Cl.³ C07C 2/02
U.S. Cl. 585—526 38 Claims

1. A process for oligomerizing ethylene to normal alpha-olefins and recovering said olefins from the reaction product which comprises reacting ethylene under an elevated pressure greater than about 700 pounds per square inch gauge in methanol in contact with a nickel ylide defined by the following formula:




wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$ and $R_8$ are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms; aryl radicals having from about six to about 20 carbon atoms; alkenyl radicals having from about two to about 30 carbon atoms; cycloalkyl radicals having from about three to about 40 carbon atoms; aralkyl and alkaryl radicals having from about six to about 40 carbon atoms; halogen radicals, hydroxyl, alkoxy and aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl alkoxy or aryloxy groups, provided that at least one of each of $R_1$ to $R_8$ radicals is a sulfonato group or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl group carrying a sulfonato group; M is sulfur or oxygen; E is phosphorus, arsenic, antimony or nitrogen; and F is phosphorus, arsenic or antimony, to obtain a reaction product containing (A) a methanol phase having dissolved therein said nickel ylide and (B) an alpha-olefin phase, and then separating said phases from each other to recover said alpha-olefin phase.

4,382,154

## DEVICE SENSITIVE TO A TEMPERATURE GRADIENT AND ITS APPLICATION FOR CONSTRUCTING A THERMAL FLUXMETER OR SOLAR SENSOR

Pierre Thery, Villeneuve d'Ascq; Guy Ravaliters, and Michel Cornet, both of Bethune, all of France, assignors to Agence Nationale De Valorisation De La Recherche (ANVAR), France

Filed Dec. 2, 1980, Ser. No. 212,255
Claims priority, application France, Dec. 3, 1979, 79 29699
Int. Cl.³ H01L 35/32
U.S. Cl. 136—206 13 Claims

1. A device sensitive to heat flow or to a temperature gradient with at least one thermoelectric cell comprising essentially at least one continuous thin layer of a first conducting material having a face thereof coated with a thinner electrolytic deposit of a second conducting material different from said first conducting material and having thermoelectric properties differing from the thermoelectric properties of said first conducting material, and at least one pair of layers of an insulating material disposed on opposite faces of at least one thin layer and said deposit, the heat flow or temperature gradient being applied across a first one of said pair of layers, said at least one thin layer, said deposit and the second one of said pair of layers when said device is in operation, and at least one part comprising at least one thin layer, said deposit or said pair of layers having a dissymetric shape or being displaced relative to another of said parts.

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4,382,155

## LOCK FOR A TEST STATION APPARATUS

Frank W. Borin, 2552 Almaden Ct., Bel Air, Calif. 90024 and Jeffrey G. Thomas, 17800 Rayen, Northridge, Calif. 91423

Filed Sep. 22, 1980, Ser. No. 189,086
Int. Cl.³ H02G 9/02, 3/08; H05K 5/00
U.S. Cl. 174—38 8 Claims

1. A cathodic test station apparatus for coupling conductor leads extending from a pipe, a casing, an anode, the soil or the like to a device to measure, supply or respond to an electrical current or potential, said apparatus including the combination of a support member, a collar including a side wall to engage said support member for support thereby, said collar including an end wall having an opening to pass test leads through the collar, at least one thread segment on only a peripheral part of the side wall of said collar, terminal block means including terminals supported by said collar to traverse across the opening therein for supporting test leads when extending through the opening, cover means, including an internal support seat engageable with said collar, for enclosing said terminals, said cover means further including a rim portion having at least one circumferential thread bar spaced from said support seat for urging said seat into clamping engagement with said collar when said thread segment and said thread bar are in engagement and are rotated relative to each other whereby said clamping engagement increases by continued rotation of said cover means until further rotation is impossible, said rim portion having at least one discontinuous circumferential recess between terminal ends of said thread bar, said circumferential recess having a peripheral length at least equal to the length of said thread segment for passage of said thread segment into said rim portion, and a generally L-shaped lock carried by said end wall with a radially extending resilient leg overlying the outer surface of the side wall of said collar adjacent the leading end of said thread segment thereon, said cover means and the rim portion thereof enclosing said L-shaped lock when threadedly engaged with a thread segment on said collar and said L-shaped lock lockingly engages a trailing end of said thread bar thereby preventing counterrotation, the resilient leg of said lock projecting from the rim portion of said cover for allowing access thereto so the depressing said resilient leg toward the side wall of said collar moves said resilient leg into an unlocked position whereby said thread bar can counterrotate past said resilient leg.

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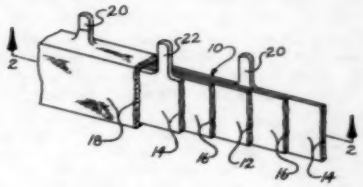
4,382,156

## MULTILAYER BUS BAR FABRICATION TECHNIQUE

Raymond C. Jodoin, Scottsdale, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Mar. 31, 1981, Ser. No. 249,642
Int. Cl.³ H01B 5/00
U.S. Cl. 174—72 B 5 Claims




1. A bus bar assembly including:
a pair of spatially separated elongated conductors, said conductors each having a pair of oppositely disposed planar surfaces, the facing surfaces of said conductors being parallelly oriented; and
a layer of ceramic material positioned between and in contact with the said facing surfaces of said conductors, said ceramic being in the green state.

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4,382,157

## MULTIPLE SPEAKER TYPE SOUND PRODUCING SYSTEM

Kenneth P. Wert, Jr., Elysburg, Pa., assignor to Kenneth P. Wert, Sr., Irvine, Calif.

Continuation-in-part of Ser. No. 925,533, Jul. 17, 1978, abandoned. This application Jun. 28, 1979, Ser. No. 52,721
Int. Cl.³ H04S 1/00
U.S. Cl. 179—1 G 7 Claims

1. An apparatus for generating at least four audio output channels from first and second stereophonically related audio signals, said output channels including a leftmost channel, a

rightmost channel, and at least two intermediate channels, said apparatus comprising:

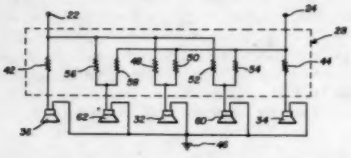
a plurality of speakers, each said audio output channel being operatively connected to one of said speakers, said speakers being oriented in an ordered series in front of a listener such that the leftmost speaker, for output of said leftmost channel, is at the listener's left; the rightmost speaker, for output of said rightmost channel, is at the listener's right; and each intermediate speaker, for output of each said intermediate channel, is positioned therebetween, with half on one side of a midpoint between said leftmost and rightmost speakers and half on the opposite side;

means for attenuating said first signal out as an unmixed signal of said leftmost output channel;

means for attenuating said second signal out as an unmixed signal of said rightmost output channel; and

means in each said intermediate channel for coupling a portion of each said first and second signals out as said intermediate output channels including:

means for mixing a predetermined amplitude portion of said



first audio signal with a predetermined amplitude portion of said second audio signal said means comprising:

means for coupling a lesser amplitude portion from said signal to each said intermediate channel, the amplitude thereof being a function of the distance that the corresponding intermediate speaker is away from said leftmost speaker and nearer to said rightmost speaker; and

means for coupling a lesser amplitude portion from said second signal to each said intermediate channel, the amplitude thereof being a function of the distance that the corresponding intermediate speaker is away from said rightmost speaker and nearer to said leftmost speaker to the same extent that said amplitude portion from said first signal is lessened in amplitude in the opposite direction from said leftmost speaker;

said attenuating means and mixing means including equalizer means, for equalizing the relative amplitudes of said unmixed and mixed signals, such that the output from each intermediate channel is of substantially the same relative amplitude as the output of said first and second signals attenuated in said leftmost channel and said rightmost channel.

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**4,382,158**

## TONE CONTROL OF THE OPERATIONAL TYPE

**Akihiro Ohshita, and Keizo Okuno, both of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 11, 1980, Ser. No. 186,324**
**Claims priority, application Japan, Mar. 22, 1980, 55-37697**
**Int. Cl.³ H04R *3/00***
**U.S. Cl. 179—1 D** **9 Claims**

1. A tone control circuit for modifying an audio signal comprising:

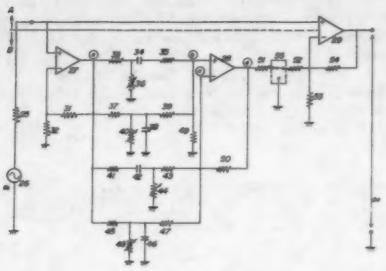
an input terminal;

an output terminal;

means for directly passing said audio signal from said input terminal to said output terminal;

modification means for modifying said audio signal to produce a boost or attenuation signal corresponding to at least a portion of the frequency spectrum of said audio signal;

said means for directly passing said audio signal further including means for adding or subtracting said boost or attenuation signal to said audio signal, only when desired,



to boost or attenuate the portion of said frequency spectrum selected by said modification means.

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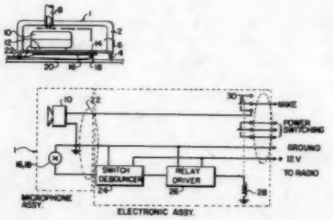
**4,382,159**

## BLOW ACTUATED MICROPHONE

**Robert S. Bowditch, 1851 Campesino Pl., Oceanside, Calif. 92054**

**Filed May 29, 1981, Ser. No. 268,364**
**Int. Cl.³ H04B *1/44***
**U.S. Cl. 179—1 HF** **6 Claims**




1. In an acoustical sound processing device a combination microphone means and blow actuated keying and unkeying means comprising:

(a) a plenum chamber defining a pressure release orifice,

(b) a conduit means in fluid communication with the chamber means, the conduit means having an open end to permit a speaker to vocalize and blow into the conduit means,

(c) a blow detector means with two stable output states, a first and second, adapted to alternate between said states in response to blows of suitable strength which are directed into the conduit means such that for each distinct momentary blow, the output of the blow detector means changes state only once,

(d) a means for keying and unkeying the sound processing device when the output of the blow detector means is in the first and second states respectively,

(e) a transducer means disposed within the plenum chamber for converting acoustic vibrations to a corresponding varying electrical signal, the transducer means being in electrical communication with the sound processing device for the primary purpose of sending said signal to said device.

## 4,382,160
## METHODS AND APPARATUS FOR ENCODING AND CONSTRUCTING SIGNALS

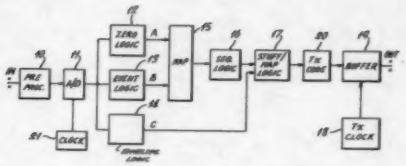
Harold W. Gosling, Weston, and Reginald A. King, Tilehurst, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 26,727, Apr. 3, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,462

Claims priority, application United Kingdom, Apr. 4, 1978, 13135/78; Jun. 12, 1978, 26728/78

Int. Cl.³ H04B 1/66

U.S. Cl. 179—15.55 R 50 Claims



1. A method of encoding and decoding an input signal having at least an alternating component comprising the steps of:

generating a succession of first signals, each of said first signals being related to the duration of a corresponding sub-division of said input signal;

generating a succession of second signals, each of said second signals being related to at least one characteristic of waveform shape of a corresponding said sub-division, said first and second signals being the encloded form of said input signal;

transferring said first and second signals along a channel as a result of which said first and second signals are transformed into related third and fourth signals, respectively; and

generating an analogue signal in response to said third and fourth signals, said analogue signal having sub-divisions of durations related to said third signals, each said sub-division of said analogue signal having a shape related to a corresponding one of said fourth signals, said sub-divisions being defined by any predetermined characteristic of said input signal waveform so long as said input signal alternating component does not have more than three zero crossings in any of said sub-divisions.

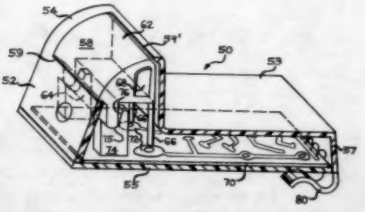
## 4,382,161
## CLIP-ON ELECTRONIC SWITCHING AND HOLD DEVICES FOR TELEPHONES

George A. Saer, 2251 Montgomery Ave., and Jeffrey D. Stein, 1303 Belleview, both of Cardiff-by-the-Sea, Calif. 92009

Continuation-in-part of Ser. No. 129,387, Mar. 11, 1980. This application Jan. 26, 1981, Ser. No. 228,397

Int. Cl.³ H01H 3/04, 21/80; H04M 1/06, 1/21

U.S. Cl. 179—81 C 12 Claims



1. For a telephone having a handset and a cradle, said cradle including pairs of projections respectively formed and disposed at opposite sides thereof and a ledge formed between said oppositely disposed pairs of projections, a device to be attached at said telephone cradle for receiving the telephone handset and for controlling the telephone circuits, said device comprising:

a housing having a top and a bottom,

the bottom of said housing being positioned adjacent said cradle ledge,

the top of said housing having an arcuate ridge extending completely across a first end thereof, said arcuate ridge being aligned with and positioned between two of the projections of the said pairs so as to extend the outline of said two projections across a corresponding first end of said cradle,

circuit means located within said housing and electrically connected to the circuits of the telephone to control the operation thereof,

switching means located within said housing for controlling the energization of said circuit means,

actuator means located within said housing and extending through the arcuate ridge at the top of said housing, said actuator means having a pivotable member thereof, and

pivot support means located within said housing to interface with the pivotable member of said actuator means, so that said actuator means can be pivoted at said pivot support means and rotated into physical contact with said switching means in order to operate said switching means and thereby control the energization of said circuit means.

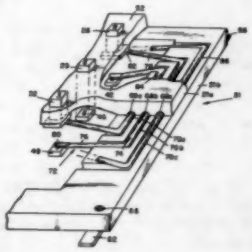
## 4,382,162
## CALCULATOR PUSHBUTTON FORMAT ATTACHMENT FOR PUSHBUTTON TELEPHONES

Hugh J. Metz, 4328 Deerfield Rd., Knoxville, Tenn. 37921

Filed May 26, 1981, Ser. No. 266,742

Int. Cl.³ H04M 1/23; H01H 3/20

U.S. Cl. 179—90 A 4 Claims



1. An attachment for mounting over the keyboard of a pushbutton telephone for converting from the telephone pushbutton format to a standard calculator pushbutton format comprising:

a. a housing constructed for mounting on a pushbutton type telephone over the identified telephone pushbuttons arranged and identified in telephone format;

b. at least twelve pushbuttons arranged and identified in a calculator format mounted in said housing, with a first end projecting above said housing for operation by a telephone user, and a further end within said housing; and

c. u-shaped levers corresponding only to the number of identified pushbuttons in said housing that are not in format registry with corresponding identified pushbuttons of said telephone, said levers being rotatable within said housing and each lever having a first arm with a distal end in contact with a correspondingly identified one of said telephone pushbuttons and a further arm with a distal end in registry with a correspondingly identified one of said at least twelve pushbuttons, said distal end of said further

arm being more elevated from said telephone pushbuttons than said distal end of said first arm.

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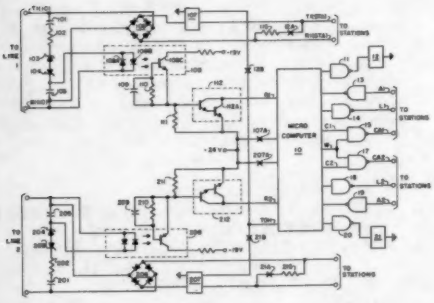
4,382,163

## MICROCOMPUTER CONTROLLED KEY TELEPHONE LINE CIRCUIT

Thomas E. White, Margate, Fla., and Paul U. Lind, Lombard, Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Continuation-in-part of Ser. No. 81,582, Oct. 3, 1979. This application Jul. 27, 1981, Ser. No. 286,834
Int. Cl.³ H04Q *5/18*
U.S. Cl. 179—99 LC 6 Claims



1. A microcomputer controlled key telephone line circuit for use with a key telephone system including a plurality of lines, and a plurality of key telephones, said lines employed to transmit a ringing voltage and a loop signal, said key telephones each including an audible signaling device, a hold key a plurality of line pickup keys and visual signaling devices associated with said plurality of lines, a plurality of control leads each employed to indicate operation and release of an associated line pickup key of hold key, said line circuit comprising:

ringing detection means connected to said plurality of lines operated in response to said ringing voltage to generate a ringing signal;

scanning means connected to said ringing detection means, to said lines and to said control leads, said scanning means operated to scan said lines and said control leads in a predetermined periodic time, said scanning means further operated to detect said ringing signal, said loop signal, operation of said line pickup keys and said hold keys;

signaling means connected to said scanning means, to said visual signaling devices, said audible signaling devices and said lines, operated in response to detection of operation of each of said line pickup keys to signal associated visual signaling devices, in a first manner, further operated in response to said detected ringing signal on each of said lines to signal associated visual signaling devices, in a second manner, and to signal associated audible signaling devices, and further operated in response to detection of operation of each of said hold keys to signal associated visual signaling devices in a third manner and to generate an associated bridging signal; and

bridging means connected to said lines and said signaling means, operated in response to said bridging signal to bridge an associated line.

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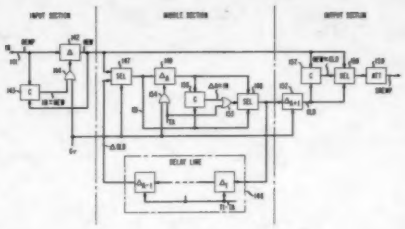
4,382,164

## SIGNAL STRETCHER FOR ENVELOPE GENERATOR

Carl J. May, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 115,185, Jan. 25, 1980, Pat. No. 4,277,645. This application Oct. 30, 1980, Ser. No. 202,336
Int. Cl.³ H04B *3/20*
U.S. Cl. 179—170.2 2 Claims



1. A signal envelope stretcher comprising:

peak catching means (142–144) for following rising portions of an input signal and retaining a first output indicative of the peak magnitude of the input signal attained during a predetermined interval;

storing and comparing means (146–149, 151, 153, 154 and 156) connected to receive and retain the output and a predetermined plurality of previous peak magnitudes corresponding to previous predetermined intervals, the storing and comparing providing a second output indicative of the greater of the first output and each one of the previous peak magnitudes, the second output serving to replace the previous peak magnitudes when greater as it is compared thereto; and

output means (152, 157, 158) connected to receive the first output and the second output at the beginning of each one of the predetermined intervals, the output means retaining the second output corresponding to the previous first output occurring at the beginning of its corresponding predetermined interval for the duration of the predetermined interval while producing an output for the signal envelope stretcher corresponding to the greater of the stored second output and the first output.

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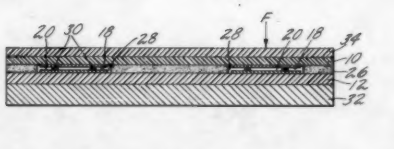
4,382,165

## MEMBRANE KEYBOARD AND METHOD OF FORMATION THEREOF

Frederick A. Balash, and James B. Daugherty, both of Mesa, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed Sep. 22, 1980, Ser. No. 189,119
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—5 A 11 Claims




1. An electric switch including:

first electrical contact means;

second electrical contact means;

a layer of electrically nonconductive adhesive material between said first and second contact means, said adhesive layer having an opening therein to permit contact to be effected between said first and second electrical contact means; and

a discontinuous pattern of said nonconductive adhesive material on at least one of said first and second electrical contact means within the area defined by said opening.

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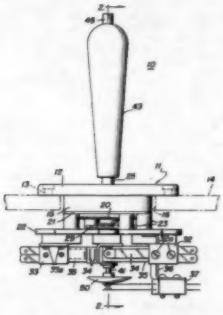
## 4,382,166
## JOYSTICK WITH BUILT-IN FIRE BUTTON

**Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.**

**Filed Dec. 3, 1981, Ser. No. 327,261**
**Int. Cl.³ H01H *19/00***
**U.S. Cl. 200—6 A** **10 Claims**



1. Joystick apparatus comprising a tube having an axis, a rod reciprocally movable in said tube axially thereof between a withdrawn position and an extended position, first actuator means mounted on said rod, second actuator means attached to said tube, first switch means disposed for operation by said first actuator means when said rod is disposed in the extended position thereof, a plurality of second switch means disposed around said second actuator means, and mounting means disposed intermediate the ends of said tube and defining a fulcrum point thereat and supporting said tube for tilting movement about said fulcrum point to effect movement of said second actuator means for operation of a selected one or more of said second switch means, said first actuator means being constructed and arranged for cooperation with said rod to be in position to operate said first switch means in any tilting orientation of said tube.

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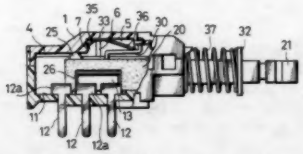
## 4,382,167
## PUSH-BUTTON SWITCH

**Takeshige Maruyama, and Sadayoshi Iwasaki, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Mar. 16, 1981, Ser. No. 244,051**
**Claims priority, application Japan, Mar. 14, 1980, 55-33163[U]; Mar. 14, 1980, 55-33168[U]**
**Int. Cl.³ H01H *13/56***
**U.S. Cl. 200—153 J** **15 Claims**



1. A push-button switch comprising:
a switch case formed with respective openings on an upper side and one end side thereof and having a plurality of rows of fixed terminal embedded on a lower side thereof;
a slide member slidably inserted into said switch case from said opening on said one end side of said switch case, said slide member being formed on an upper side thereof with a heart-shaped cam groove, on a lower side thereof with receiving portions for receiving movable contact pieces adapted to slide in contact with the fixed terminals and at a front end part thereof with an operation portion for operating said slide member against a coil spring;
a cover member being received within said opening on said upper side of said switch case for closing it, said cover member having on a lower side thereof means for holding a Z-shaped lock pin in slidable enegagement with said heart-shaped cam groove, a recess adjacent to said holding means for receiving a spring member for pressing said lock pin against said heart-shaped cam groove; and
coacting engaging means formed respectively on the side walls of said switch case and side walls of said cover member for holding the two together;
wherein one inner wall of said cover member surrounding said recess and being orthogonal to the sliding direction of said slide member is provided with a protuberance for holding said spring member, said spring member being flat and provided with an engaging piece for engaging with said protuberance.

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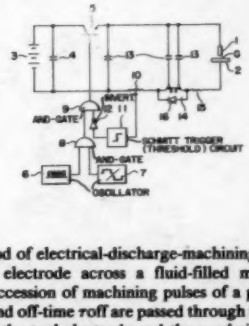
## 4,382,168
## ULTRA-FINE FINISH EDM METHOD AND APPARATUS

**Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan**

**Filed Jan. 25, 1980, Ser. No. 115,239**
**Claims priority, application Japan, Jun. 6, 1979, 54-71643**
**Int. Cl.³ B23P *1/02***
**U.S. Cl. 219—69 M** **13 Claims**




1. A method of electrical-discharge-machining a workpiece with a tool electrode across a fluid-filled machining gap wherein a succession of machining pulses of a predetermined ontime $\tau_{on}$ and off-time $\tau_{off}$ are passed through the machining gap between the tool electrode and the workpiece by repetitively turning on and off an electronic switch connected in a power circuit in series with a DC source and the machining gap with a succession of signal pulses corresponding to the machining pulses, the power circuit having a stray impedance sufficient to cause a delay before each of the machining pulses terminates following the termination of each corresponding signal pulse applied to said switch, the method comprising the steps of:
setting said on-time $\tau_{on}$ at a desired value in the range between 0.01 and 1 microsecond;
sensing the rising gap current resulting from the passage of each of said machining pulses through said machining gap;
upon said sensed rising gap current exceeding a predetermined threshold value, providing a pulse interruption signal for terminating said corresponding signal applied to said switch; and
establishing said threshold value in conjunction with said desired value of the on-time $\tau_{on}$.

4,382,169

## WELD DEPOSITION OF METAL OTHER THAN ALUMINIUM ONTO ALUMINIUM-BASE ALLOY

Daniil M. Rabkin, ulitsa Leonida Pervomaiskogo, 3, kv. 21; Vladimir R. Ryabov, prospekt Malinovskogo, 25, kv. 114; Vsevolod N. Bernadsky, ulitsa Anri Barbjusa, 22/26, kv. 15; Anatoly D. Stretovich, ulitsa Parkhomenko, 26, kv. 89; Vladimir A. Kirpaty, ulitsa Leonida Pervomaiskogo, 3, kv. 6, all of Kiev; Ivan A. Koval, ulitsa Girshmana, 18, kv. 5, Kharkov; Valery F. Zlobin, ulitsa Engelsa, 26, kv. 35, Kiev; Arkady B. Menaker, ulitsa Malyshko, 37, kv. 53, Kiev; Yakov I. Sherman, ulitsa Scherbakova, 45, kv. 8, Kiev; Nikolai N. Meleshko, ulitsa Koroleva, 6, kv. 52, Kiev, and Alexandr N. Shalai, ulitsa Korolevas, 6a, kv. 31, Kiev, all of U.S.S.R.

Filed Mar. 24, 1981, Ser. No. 247,212

Int. Cl.³ B23K 9/04

U.S. Cl. 219—76.1 5 Claims

1. A method of depositing a layer of a metal other than aluminum onto an aluminum-based alloy, comprising:

(a) introducing into a weld pool about 20 to 98% by weight of a surfacing material based on alloying elements;

(b) depositing said surfacing material onto said aluminum-based alloy from said weld pool using a heat source having a heat output from $10^3$ to $10^5$ W/cm$^2$; and

(c) remelting the deposited surfacing material while increasing the volume of the weld pool 1.2 to 10 times each time the deposited surfacing material is remelted.

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4,382,170

## THERMAL CUTTING JET DEVICE WITH SUCTION APPARATUS

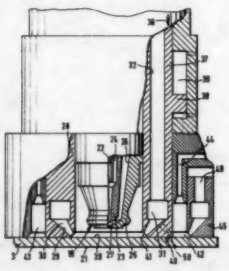
Hans Klingel, Simsbury, Conn., assignor to Trumpf GmbH & Co., Fed. Rep. of Germany

Filed Mar. 11, 1981, Ser. No. 242,712

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032728

Int. Cl.³ B23K 9/00

U.S. Cl. 219—121 PP 12 Claims



1. A machine for processing flat workpieces comprising:

a support;

a cutting jet nozzle connected to said support for discharging a cutting jet downwardly to cut a workpiece at a cutting location spaced above a workpiece to be cut;

liquid nozzle means connected to said support for discharging a liquid stream concentrically of the cutting jet, said liquid nozzle means mounted concentrically of said cutting jet nozzle;

drive means connected to said support for moving a workpiece in the plane of the workpiece and past said jet nozzle; and

suction means connected to said support and concentrically mounted around said jet nozzle, and including suction nozzle means concentric of said jet nozzle for drawing up gas and liquid from the cutting area, said suction nozzle means being positioned closer to a workpiece to be cut than said jet nozzle during discharge of said cutting jet so as to place said suction nozzle means as close as possible to a workpiece to be cut.

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4,382,171

## ARC WELDING CURRENT SUPPLY

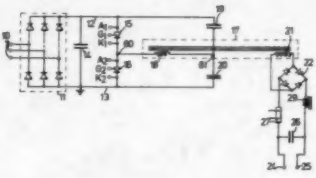
John B. G. Hedberg, Hanover, N.H., assignor to Thermal Dynamics Corporation, West Lebanon, N.H.

Continuation-in-part of Ser. No. 891,804, Mar. 30, 1978, abandoned, which is a division of Ser. No. 795,501, May 10, 1977, abandoned. This application Sep. 19, 1980, Ser. No. 188,793

Claims priority, application United Kingdom, May 12, 1976, 19532/76

Int. Cl.³ B23K 9/10

U.S. Cl. 219—130.1 7 Claims



1. An arc welding current supply providing power to welding electrodes comprising:

a.c. to d.c. rectifier means for converting an a.c. source voltage to a d.c. source voltage;

a controlled frequency d.c. to a.c. inverter means, connected to said rectifier means, for converting said d.c. source voltage into an a.c. voltage, said inverter operating with a half period which is less than the average duration of the current and voltage transients caused by short circuits through droplets of a welding material;

a transformer having a primary winding connected in said inverter circuit and a secondary winding connected to said welding electrodes; and

control device means for controlling said inverter in a manner such that the arc power of the welding arc remains substantially unchanged irrespective of changes in load caused by the welding operation;

said inverter comprising first and second thyristors, at least one charge-discharge capacitor and said primary winding; said first thyristor, said at least one capacitor and said primary winding being connected in series and connected to said d.c. source voltage, whereby said at least one capacitor is charged during the conduction of said first thyristor; said second thyristor being connected in a circuit loop with said primary winding and said at least one capacitor, whereby said capacitor is discharged during the conduction of said second thyristor;

said control device means comprising an open loop system including means for alternatingly igniting said first and second thyristors at said controlled frequency, the duration between the ignition and cutoff of each said thyritor being sufficient to completely charge and discharge said capacitor.

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4,382,172

## METHOD FOR FABRICATING A WATCH CASE

Tsuneji Takasugi, and Seiji Umezawa, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,111

Claims priority, application Japan, Apr. 22, 1980, 55-54918[U]

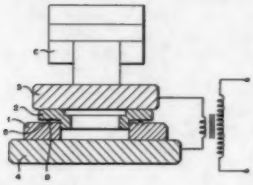
Int. Cl.³ B23K 9/02, 9/04

U.S. Cl. 219—137 R 7 Claims

1. A method for fabricating a watch case comprising the steps of:

placing contact points of a bezel and a watch body to face each other;

applying pressure to said bezel and watch body by means of electrodes; and



applying pulse current including heating periods for heating said contact points and cooling periods for cooling said bezel and watch body of the heat transmitted from said contact points to said electrodes until said contact points get molten to form a joint.

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**4,382,173**

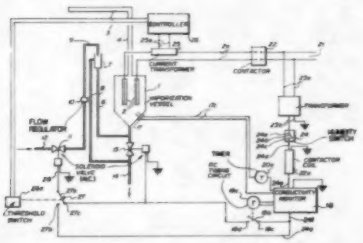
**SYSTEM FOR AUTOMATICALLY REGULATING WATER CONDUCTIVITY IN AN ELECTRODE-TYPE HUMIDIFIER EVAPORATOR**

**Michael Howard-Leicester, Edelweiss Valley, c/o General Delivery, Wilson's Corners, Quebec, Canada**

**Continuation of Ser. No. 919,307, Jun. 26, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,117**

**Int. Cl.³ H05B** *3/60, 3/02;* **F22B** *1/30*

**U.S. Cl. 219—295** **11 Claims**



1. A water evaporator comprising an evaporator vessel, spaced electrodes arranged vertically in the vessel, means including inlet valve means for connecting a source of water to the vessel to immerse the electrodes at least partly, means for connecting a source of electrical power across the electrodes whereby a current will flow between the electrodes, the current having a magnitude dependent on the depth of the immersion of the electrodes in the water, the conductivity of the water and the applied voltage, means communicating with the interior of the vessel for conveying steam generated in the vessel by the current into an air space the moisture content of which is to be controlled, means for controlling the inlet valve means to maintain the water level in the vessel at or near a predetermined value, drain means for said vessel including a normally closed outlet valve means, probe means for measuring the conductivity of the water in the vessel during operation of the evaporator and with the outlet valve means closed, control means connected to the outlet valve means and responsive to the conductivity sensed by the probe means and including means, operative in response to the conductivity measured by the probe means exceeding a predetermined reference conductivity value, to open and maintain the outlet valve means open for a length of time directly dependent on the amount by which the measured conductivity exceeds the predetermined value, and timing means connected and arranged to cause said probe means to measure the conductivity of the water in the vessel at predetermined intervals during operation of the evaporator.

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**4,382,174**

**INFRA-RED HAIR DRYER**

**Ileana D. Barna, Riverside, Conn., assignor to Clairol Incorporated, New York, N.Y.**

**Filed Jan. 9, 1981, Ser. No. 223,622**

**Int. Cl.³ H05B** *3/40;* **A45D** *20/10*

**U.S. Cl. 219—370** **5 Claims**

1. A hand held electric hair dryer comprising:

a housing in the shape of a pan having an air inlet and an air outlet;

a low RPM fan motor fixed inside said housing between said air inlet and said air outlet;

an axial fan on the shaft of said motor between said air inlet and said motor;

an annular air diffuser facing the air outlet and fixed to said housing between said fan and said air outlet wherein the air diffuser has a multiplicity of circumferential rows of perforations, each row being a different diameter and having the perforations therein the same distance apart as the perforations in the other rows, the size of the perforations in the row with the largest diameter being smaller than the perforations in the other rows and the size of the perforations in the row with the smallest diameter being larger than the perforations in the other rows;

an annular infrared emitting quartz tube fixed to said air duffuser on the air outlet face thereof, said quartz tube having a heater therein,

and electrical connecting means for powering said fan motor and said heater.

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**4,382,175**

**APPARATUS FOR CONTROLLING TOAST COLOR IN A TOASTER OVEN**

**Peter E. Huggler, Boone County, Mo., assignor to Toastmaster, Inc., Columbia, Mo.**

**Filed Nov. 5, 1981, Ser. No. 318,398**

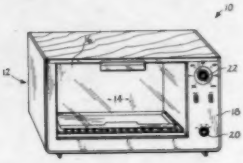
**Int. Cl.³ F27D** *11/02*

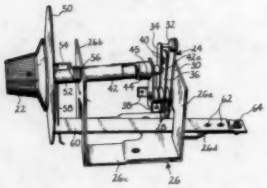
**U.S. Cl. 219—413** **7 Claims**

1. In a toaster oven having an oven cavity for receiving food including bread to be toasted, means for heating the oven cavity, a thermostat for controlling said heating means, a temperature scale, a manually operated control member for setting the thermostat, and an indicator mark on said control member for indicating on said temperature scale the temperature setting of the thermostat, the combination therewith of:

a movable toast color scale located adjacent said temperature scale and movable independently of said control member along a preselected path corresponding to the path of movement of said control member when same is adjusted to vary the thermostat setting;

temperature sensitive means for effecting movement of said toast color scale along said preselected path in a first direction when the oven cavity temperature increases and in a second direction opposite said first direction when the oven cavity temperature decreases, said first direction corresponding to movement of said control member in a





direction to increase the temperature setting of the thermostat; and

a plurality of toast color indications on said color scale each indicating a different desired toast color, each color indication moving with said color scale along the temperature scale and being located thereon to align with a temperature indication on the temperature scale that will effect toasting of the bread to the corresponding color when said control member is moved to set said indicator mark at the color indication and the thermostat is subsequently satisfied to deenergize the heating means.

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**4,382,176**

**TEMPERATURE CONTROL ARRANGEMENT FOR AN ELECTRICAL HEATING APPLIANCE**

**Paul A. P. Wood, Richmond, England, assignor to PIFCO Limited, Manchester, England**

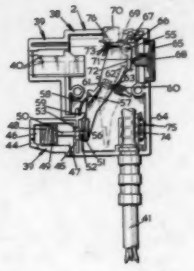
**Filed Mar. 31, 1981, Ser. No. 249,590**

**Claims priority, application United Kingdom, Apr. 1, 1980, 8010875; Apr. 24, 1980, 8013549**

**Int. Cl.³ H05B *1/02***

**U.S. Cl. 219—494** **8 Claims**

1. A temperature control apparatus for an electrical heating appliance, the heating appliance having an electrical heater therein, comprising: means for attaching the temperature control apparatus of said appliance and for connecting the temperature control apparatus to an electricity supply whereby the electrical heater is supplied with electricity via the temperature control apparatus; thermostat means comprising a heat sensitive actuator and a switch operable by the heat sensitive actuator, the actuator comprising a shape memory effect actuator adapted to operate at a predetermined temperature, and heat transfer means, whereby when the temperature control apparatus is connected to said appliance, transfer of heat can take place from the appliance to the actuator via the heat transfer means so that, in use, the actuator operates the switch to switchably control the supply of electricity to the electrical



heater in accordance with a sensed temperature of the appliance.

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**4,382,177**

**SUBSTANTIALLY TRANSPARENT INSULATING ANTI-CONDENSATION STRUCTURE**

**James J. Heaney, 2020 Maginn Dr., Glendale, Calif. 91202**

**Filed Sep. 15, 1980, Ser. No. 187,558**

**Int. Cl.³ H05B *3/06***

**U.S. Cl. 219—522** **4 Claims**

1. A substantially transparent single-pane insulating structure, positionable between a warmer region and a colder region, comprising:

(a) a substantially transparent pane, one surface being exposed in use to the warmer region, the opposed surface facing the colder region in use;

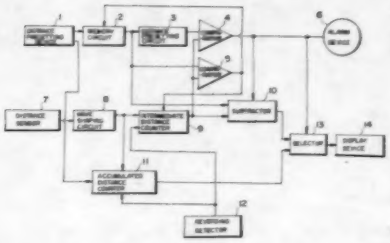
(b) means applied to the surface of the pane which in use faces the colder region for electrically heating the pane, so as to heat the surface of the pane exposed in use to the warmer region; and

(c) means applied over the electrical heating means for reflecting a substantial portion of infrared radiation incident on said reflecting means through the pane to the surface of the pane exposed in use to the warmer region, so as to restrict substantial transmission of infrared radiation from the warmer region to the colder region, and so as to heat the surface of the pane exposed in use to the warmer region sufficiently in combination with the heat provided by the electrical heating means to prevent formation of a visibility-impeding layer thereon while minimizing use of electrical energy therefor, and so that, in preventing formation of the visibility-impeding layer, the reflected infrared radiation is reradiated into the warmer region so as to inhibit reradiation thereof into the colder region, and for transmitting a substantial portion of visible light radiation incident on said reflecting means; to enable substantially clear visibility therethrough.

## 4,382,178
## ELECTRONIC TRIP METER FOR AN AUTOMOTIVE VEHICLE

**Kazuyuki Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan**

**Filed Mar. 7, 1980, Ser. No. 128,189**
**Claims priority, application Japan, Mar. 9, 1979, 54-30179**
**Int. Cl.³ G06M 3/02**
**U.S. Cl. 377—17** **15 Claims**



1. An electronic trip meter for an automotive vehicle, which comprises:

(a) means for storing sector distances between a start check point, an intermediate check point, and an end check point;

(b) means for calculating positions of alarm points at predetermined distances ahead of each of the intermediate and end check points, based on the sector distances stored in the storing means;

(c) a first counter which counts distance travelled from the last check point passed, or if none have been passed, from the start point;

(d) a first comparator which outputs a signal for so long as the value in said first counter is equal to or greater than a value calculated by the calculating means for a position of an alarm point which corresponds to the point at the predetermined distance ahead of the next check point;

(e) a second comparator which outputs a signal to said storing means and to said first counter so as to reset said storing means to present information relevant to the next check point, and to zero said first counter, when the value in said first counter coincides with the value presented by said storing means;

(f) a first alarm device;

(g) means for activating said first alarm device whenever the distance travelled by the vehicle is such as to place the vehicle between an alarm point and an associated one of said intermediate and end check points, comprising means for connecting the output signal from said first comparator to said first alarm device thereby activating said first alarm device for so long as said first comparator provides said output signal thereof;

(h) a subtractor for subtracting the value in said first counter from the value presented by said sector distance storing means whenever said first comparator is providing said output signal, and

(i) a display device which displays the result produced by the subtractor.

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## 4,382,179
## ADDRESS RANGE TIMER/COUNTER

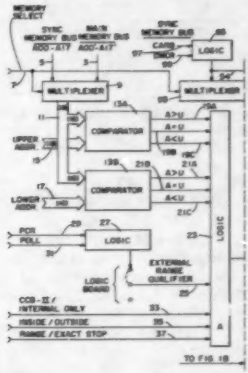
**Perry W. Penton, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio**

**Filed Jul. 21, 1980, Ser. No. 170,379**
**Int. Cl.³ G11B 27/36; G06M 3/06**
**U.S. Cl. 377—20** **20 Claims**

1. A system for measuring execution time required for the execution of a plurality of instructions from a plurality of addresses in a memory, each of the instructions being stored in said memory and having a particular address associated therewith, said memory being accessed by means of a memory bus to effect executing of said instructions, said system comprising in combination:

a. first coupling means for coupling said system to the memory bus;

b. first comparison means responsive to said first coupling means for comparing any particular address and subsequent said particular addresses on the memory bus with a first address number to detect whether said particular address and subsequent said particular addresses are in a first range bounded by said first address number;



c. first logic circuit means responsive to said first comparison means for producing a first signal having a first level while a said particular address and subsequent said particular addresses are in said first range and a second level if said particular address and subsequent said particular addresses are not in said first range; and

d. first counting means responsive to said first logic circuit means for counting at a predetermined rate to produce an accumulated count if said first signal is at said first level, wherein said first counting means does not count if said first signal is at said second level, the accumulated count in said first counting means representing the accumulated execution time during which addresses on said memory bus from said plurality of addresses are in said first range.

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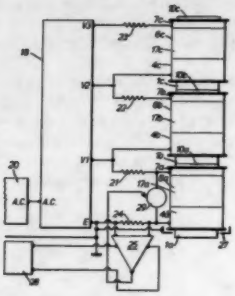
## 4,382,180
## IMAGE INTENSIFIER DEVICES

**Anthony J. Woolgar, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England**

**Filed May 30, 1979, Ser. No. 43,469**
**Claims priority, application United Kingdom, May 30, 1978, 25752/78**
**Int. Cl.³ H01J 31/50, 40/14**
**U.S. Cl. 250—213 VT** **8 Claims**

1. An image intensifier arrangement including at least one stage and means responsive to the photo current of said stage for discharging capacitance associated with that or another stage, whereby to limit the level of current density to which the anode screen of said last mentioned stage is subjected as a result of a high intensity input flash of light, wherein said responsive means comprises a resistance in a supply path for operating potential to either the photo cathode or the anode

screen of a stage, an a.c. coupled amplifier connected across said resistance and providing an output, and an active device



triggerable by said amplifier output to discharge said capacitance as aforesaid.

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**4,382,181**

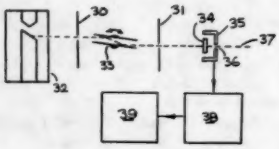
## DETECTION OF ATOMS USING MONOCHROMATIC X-RAYS

**Chia-Gee Wang, P.O. Box 211, Millwood, N.Y. 10546**

**Continuation-in-part of Ser. No. 116,177, Jan. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 70,586, Aug. 29, 1979, Pat. No. 4,239,966. This application Feb. 27, 1981, Ser. No. 239,135**

**Int. Cl.³ G01N *23/20***

**U.S. Cl. 250—305** **41 Claims**



1. A method of detecting, in a specimen, atoms, of a particular element having an atomic number of at least 20, comprising irradiating the specimen with monochromatic X-rays having a wavelength to induce an inner shell ionization of said atoms with subsequent auger cascade, and detecting the auger electrons emitted by the cascade wherein the specimen is irradiated alternately with X-rays of said wavelength and with X-rays of a wavelength less than said wavelength and the difference between the auger electrons detected at said wavelength and at the shorter wavelength is determined.

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**4,382,182**

## METHOD OF DISPLAYING AN IMAGE OF PHASE CONTRAST IN A SCANNING TRANSMISSION ELECTRON MICROSCOPE

**Takashi Matsuzaka, Kokubunji, and Hideo Todokoro, Hinodemachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 22, 1981, Ser. No. 266,290**

**Claims priority, application Japan, May 26, 1980, 55-68969**

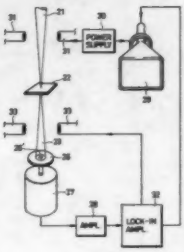
**Int. Cl.³ H01J *37/28***

**U.S. Cl. 250—307** **6 Claims**

1. A method of displaying an image of phase contrast in a scanning transmission electron microscope, which comprises the steps of:

illuminating a specimen with a primary electron beam,

deflecting a flux of electron beams transmitted through said specimen with high frequency, said flux of electron beams comprising a transmitted electron beam and scattered electron beams, so that said flux of electron beams is reciprocated on an aperture provided in an interfering region of said transmitted electron beam and said scattered electron beams,



using a detector to detect electron beams that have passed through said aperture, said detector providing signals representative of said detected beams,

picking out from the detector signals a signal component synchronized with said high frequency,

detection-rectifying the synchronized signal component, and

supplying the detection-rectified signal as an intensity modulation signal to a display equipment.

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**4,382,183**

## X-RAY DETECTOR OF SEMICONDUCTOR TYPE

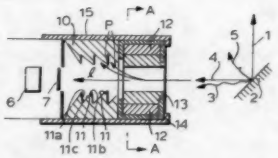
**Osamu Kimura, Kyoto, Japan, assignor to Horiba Ltd., Miyanohigashi, Japan**

**Filed Jan. 8, 1981, Ser. No. 223,291**

**Claims priority, application Japan, Jan. 22, 1980, 55-6647**

**Int. Cl.³ G01N *23/00*; G01T *1/22***

**U.S. Cl. 250—310** **12 Claims**



1. An X-ray detector with a semiconductor detecting element, for detecting X-rays emitted from a sample, upon impingement of an electron beam, in a first direction along a path, comprising:

means for generating a magnetic field perpendicular said first direction across said path so as to divert electrons along said path in directions perpendicular thereto;

first electron absorber means, located between said magnetic field means and said detector element and outside of said path, for absorbing said electrons diverted by said magnetic field means;

means, connected to said magnetic field generating means and surrounding said path, for strengthening said magnetic field across said path;

means, surrounding said magnetic field generating means and said magnetic field strengthening means, for constraining said magnetic field to within said magnetic field strengthening means, thereby protecting said electron beam from magnetic field lines generated by said magnetic field generating means; and

second electron absorber means, disposed between said path

and said magnetic field generating means, for absorbing electrons directed toward, and preventing fluorescent X-rays from being emitted from, said magnetic field generating means, said magnetic field constraining means and said magnetic field strengthening means.

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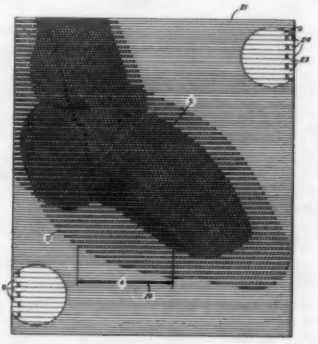
**4,382,184**

## APPARATUS AND METHOD FOR SIMULTANEOUSLY DISPLAYING RELATIVE DISPLACEMENTS OF A FLUCTUATING BIOLOGICAL OBJECT

**Robert E. Wernikoff, Boston, Mass., assignor to Cardiac Imaging Limited Partnership, Westport, Conn.**

**Filed Nov. 24, 1978, Ser. No. 963,373**
**Int. Cl.³ G03B *41/16*; H05G *1/30*; G01T *1/00***
**U.S. Cl. 378—37** **40 Claims**



1. X-ray apparatus for producing discrete images of a human organ in fluctuating motion, each said image being derived at a selected time related to systole and diastole, respectively, for simultaneous, independent presentation of said images on respective discrete areas within a common image plane, comprising:

(A) means for X-irradiating said organ;

(B) means for producing a diastolic timing signal for controlling the period of transmission of said X-radiation through said organ during diastole;

(C) means for producing a systolic timing signal for controlling the period of transmission of said X-radiation through said organ during systole;

(D) means for directing X-rays from said organ, during one said period, to selected discrete area segments of said image plane, each said segment corresponding with one discrete image element of one said discrete image;

(E) means for directing X-rays from said organ, during the other said period, to selected discrete area segments of said image plane, each said segment corresponding with one discrete image element of the other said discrete image, said area segments and image elements being interdigital to produce said images in an interlaced pattern, such that relative displacements of said organ between systole and diastole may be simultaneously viewed and determined from juxtaposed said image elements; and

(F) means enabling said systolic and diastolic images to be distinguished from, and identified relative to, each other.

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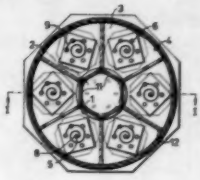
**4,382,185**

## PROPORTIONAL DETECTOR

**Johannes Baecklund, S-572 00 Oskarshamn, Sunnevik, Sweden**

**Filed Oct. 14, 1980, Ser. No. 196,584**
**Claims priority, application Sweden, Oct. 16, 1979, 7908566**
**Int. Cl.³ G01T *1/18***
**U.S. Cl. 250—385** **7 Claims**



1. A proportional detector for fluorescence measuring of an object comprising chamber means defined by at least one chamber and having a central electrode in the form of a thin wire which forms the positive electrode of the detector, the inner surfaces of said chamber means forming the negative electrode of said detector, the chamber means being formed symmetrically about a central recess, which recess is constructed to accommodate an x-ray tube with the axis of said recess coinciding with the axis of the x-ray tube in a manner such that the chamber means surrounds the x-ray tube.

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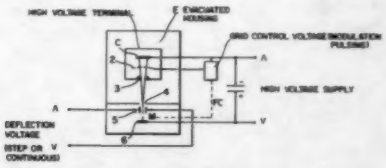
**4,382,186**

## PROCESS AND APPARATUS FOR CONVERGED FINE LINE ELECTRON BEAM TREATMENT OF OBJECTS

**A. Stuart Denholm, Lincoln; William A. Frutiger, Beverly, and Kenneth E. Williams, Andover, all of Mass., assignors to Energy Sciences Inc., Woburn, Mass.**

**Filed Jan. 12, 1981, Ser. No. 224,313**
**Int. Cl.³ H01J *37/00***
**U.S. Cl. 250—492.2** **37 Claims**




1. A process for treatment of objects with the aid of electron beam energy, that comprises, generating and propagating electrons within a vacuum along a predetermined direction and in a linear beam having spatial and temporal uniformity of both high current densities and low electron energy levels that extends transverse to said direction; converging the beam into a fine line of intense charge; and impacting the converged fine line beam upon an object-to-be-treated.

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**4,382,187**

## ELECTROMAGNETIC RADIATION DETECTION MATRIX

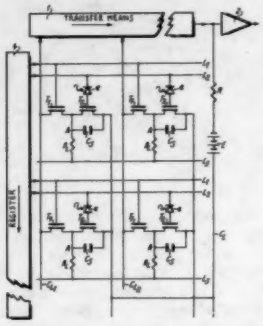
**Jean Fraleux, and Jean L. Ploix, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Nov. 5, 1980, Ser. No. 204,178**
**Claims priority, application France, Nov. 9, 1979, 79 27708**
**Int. Cl.³ H01J *40/14*; H04N *5/30***
**U.S. Cl. 250—578** **16 Claims**

1. A matrix for detecting electromagnetic radiation, comprising a photosensitive element at each crossing point of perpendicular lines and columns and means for addressing each line of photosensitive elements, wherein

said photosensitive elements are thin-film on the same dielectric substrate;

said addressing means comprise an MOS thin film transistor associated with each photosensitive element, and which receives periodically on a grid an enabling pulse applied simultaneously to all the addressing transistors in the same line of photosensitive elements;




thin film means for amplifying the electric signal provided by each photosensitive element are associated with each photosensitive element;

means for transferring to a video amplifier the electric signals provided by each line of elements addressed, these means being constituted by a device with N parallel inputs and a serial output;

to this device being connected the addressing transistors.

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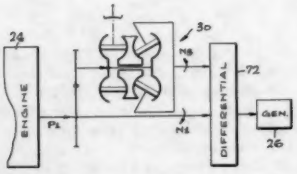
**4,382,188**

## DUAL-RANGE DRIVE CONFIGURATIONS FOR SYNCHRONOUS AND INDUCTION GENERATORS

**Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.**

**Filed Feb. 17, 1981, Ser. No. 235,354**
**Int. Cl.³ F16H *37/08, 5/42;* H02K *7/10***
**U.S. Cl. 290—1 C** **34 Claims**




1. A dual range aircraft power generation system comprising:

at least one engine;

a drive generator; and

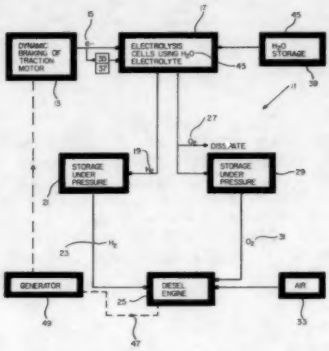
a dual-range drive means interposed between said engine and said drive generator for selectively driving said generator at constant and variable speeds over the speed range of said engine to produce scheduled dual-range power characteristics, said dual range drive means including a planetary differential gearbox and vari-drive means arranged to receive mechanical input from said engine, said vari-drive means also being adapted to provide mechanical input to said planetary differential gearbox.

**4,382,189**

## HYDROGEN SUPPLEMENTED DIESEL ELECTRIC LOCOMOTIVE

**John B. Wilson, 1008 Hanover Ct., Eldorado Hills, Calif. 95630**

**Continuation of Ser. No. 42,340, May 25, 1979. This application May 6, 1981, Ser. No. 262,051**
**Int. Cl.³ F02B *51/04***
**U.S. Cl. 290—3** **9 Claims**




1. A hydrogen supplementally fueled diesel powered locomotive comprising:

(a) a conventional diesel electric locomotive having a diesel engine as its prime mover,

(b) traction motors mounted in said locomotive adapted for dynamic braking of said locomotive and adapted to generate electricity when actuated,

(c) at least one electrolysis cell for the electrolytic decomposition of water,

(d) means coupled to said traction motors and to said, at least one, electrolysis cell to deliver electricity from said traction motors to said cell upon dynamic braking to generate hydrogen,

(e) means for supplying generated hydrogen to said diesel engine as a fuel for said engine.

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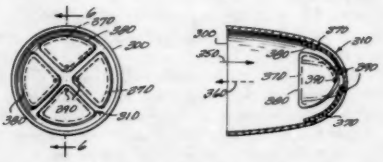
**4,382,190**

## WIND MOTOR HAVING HORIZONTALLY COUNTER-ROTATING WIND FORCE COLLECTORS

**J. Merritt Jacobson, 130 NE. 4th Ave., Boynton Beach, Fla. 33435**

**Filed Jan. 19, 1981, Ser. No. 226,026**
**Int. Cl.³ F03B *1/02;* F03D *3/02, 11/00***
**U.S. Cl. 290—55** **11 Claims**




1. An apparatus for deriving rotational kinetic energy from wind ambient to said apparatus comprising:

a support adapted to be vertically disposed;

first wind force extraction means pivotably connected to said support to rotate in a first direction substantially perpendicular to said support when exposed to wind, said first extraction means including at least one wind trapping means having a cup-shaped body with an open end and valving means disposed at the other end of said body for

permitting the passage of wind in one direction but not in the other; and at least one means for interconnecting said at least one wind trapping means and said support;

second wind force extraction means pivotably connected to said support to rotate in a second direction opposed to said first direction in a plane substantially perpendicular to said support when exposed to wind, said second extraction means including at least one wind trapping means having a cup-shaped body with an open end and valving means disposed at the other end of said body for permitting the passage of wind of one direction but not in the other, and at least one means for interconnecting said at least one wind trapping means and said support, said first and second extraction means both being disposed in an area directly responsive to said ambient wind without direction alteration of said wind except by said first and second extraction means; and

means for generating electrical energy having a shaft and a housing, said shaft being coupled to said first extracting means; and

wherein said first and second valve means includes means defining a plurality of open segments radially disposed about the central portion of said other end, a plurality of flexible flap means larger than said open segments and covering each of said open segments on the interior of said body, and means for fixedly securing each of said flap means to said central portion and for permitting each of said flap means to convergingly flex toward the interior of said body.

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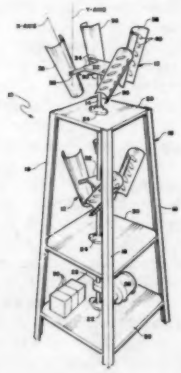
**4,382,191**

## WIND POWERED ELECTRICITY GENERATION SYSTEM

**Shirley L. Potter, 2400 Alpine Blvd., Alpine, Calif. 92001**

**Filed May 28, 1981, Ser. No. 267,803**
**Int. Cl.³ F03D** *3/00*
**U.S. Cl. 290—55** **3 Claims**



1. A wind powered electricity generation system comprising:

at least one wind vane assembly, said wind vane assembly having a carrier member, a plurality of elongated trough-shaped vanes, a plurality of support arms, fastner means attaching the back of said vanes to a point adjacent the ends of said support arms, the front end of said trough-shaped vanes pointing outwardly substantially perpendicularly from the lateral attaching surface of said support arms, each of said trough-shaped vanes having a longitudinally extending axis that makes an angle between 30 degrees and 60 degrees with a vertical axis that passes through the point of attachment of the back of the trough-shaped vane and the support arm, upstanding cleats on the surface of said trough-shaped vanes, said cleat being oriented in pairs that form the shape of an open bottom V-configuration;

an elongated shaft attached substantially perpendicularly to the bottom of said carrier member;

a tower supporting said shaft; and

drive gear means mounted on said shaft, said drive gear means being connected to an electricity generator.

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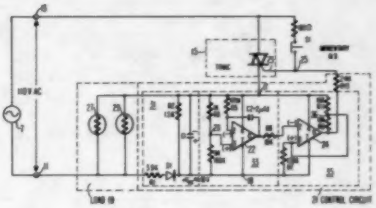
**4,382,192**

## SELF-QUENCHING CIRCUIT

**Robert M. Mendelson, Murray Hill, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 28, 1980, Ser. No. 211,342**
**Int. Cl.³ H03K** *17/26*
**U.S. Cl. 307—141.4** **14 Claims**



1. The combination comprising:

first and second terminals for an operating potential;

a switch means having a main conduction path connected between one of said first and second terminals and an intermediate circuit point, said switch means having a control means to which a turn-on or a turn-off signal may be applied;

a load and a control circuit;

turn-on means, independent of said control circuit, coupled between one of said first and second terminals and said control means, for selectively applying a turn-on signal to said control means to render said switch means conductive;

means connecting said load in parallel with said control circuit between said intermediate circuit point and the other one of said first and second terminals said control circuit and said load being powered solely when said switch means is turned-on;

said control circuit including timing circuitry for producing a timing signal a given time after said switch means is turned-on; and

means responsive to said timing signal connected to said control means of said switch means for turning off said switch means completely, thereby removing the power from said load and to said control circuit until said turn-on means renders said switch means conductive.

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**4,382,193**

## CHARGE TRANSFER MEMORY IN SERIAL-PARALLEL-SERIAL ORGANIZATION

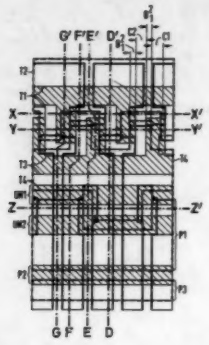
**Otto Grueter, Krailling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. 61,270, Jul. 27, 1979, abandoned. This application Mar. 12, 1981, Ser. No. 242,973**
**Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842285**
**Int. Cl.³ G11C** *19/28*; **H01L** *29/78*; **G11C** *11/34*
**U.S. Cl. 307—221 D** **1 Claim**

1. In a series-parallel-series charge transfer memory integrated on a chip for four phase operation, in which series read-in and read-out chains each comprise charge transfer

elements each having a memory electrode and a transfer electrode, in which corresponding electrodes of each second charge transfer element of the read-in chain and of the read-out chain has coupled thereto a group of at least two of the parallel chains, and in which the four clock pulse voltages for the read-in chain and the read-out chain are supplied via respective clock lines, the improvement wherein:

the electrodes associated with a respective clock pulse voltage comprise a continuous polysilicon strip conductor;



that the transfer electrodes comprise comb-shaped structures; and

the four polysilicon conductors are arranged with respect to the transfer electrodes such that a tooth of the comb shaped structure assigned to a memory electrode is partially covered by two teeth belonging to different transfer electrodes on opposite sides thereof so that the required clock pulse voltages are fed to the electrodes directly by way of the polysilicon conductors.

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**4,382,194**

**BOOSTING CIRCUIT**

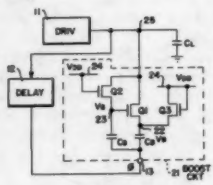
**Masao Nakano, Kawasaki; Fumio Baba, Yokohama, and Hirohiko Mochizuki, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 5, 1980, Ser. No. 213,398**

**Claims priority, application Japan, Dec. 5, 1979, 54-157751**

**Int. Cl.³ H03K** *4/24, 5/01*

**U.S. Cl. 307—264** **19 Claims**



1. A boosting circuit, operatively connectable to receive a clock signal $\phi$ and including a circuit for generating a specific voltage, for boosting a voltage of a load capacitance which is charged to the specific voltage, said boosting circuit comprising:

a boosting capacitance, one end of which is operatively connectable to receive the clock signal $\phi$;

a charging circuit, operatively connected to the other end of said boosting capacitance, for charging said boosting capacitance, said charging circuit being provided separately from the circuit for generating the specific voltage;

a gate circuit, operatively connected between the load capacitance and the other end of said boosting capacitance, for transferring the charges held by said boosting capacitance to the load capacitance; and

a gate control circuit, operatively connected to said gate circuit and said boosting capacitance, and operatively connectable to receive the clock signal $\phi$, for opening said gate circuit after the transfer of the charge of said boosting capacitance to the load capacitance in dependence upon the clock signal $\phi$ and for closing said gate circuit during the transfer of the charge of said boosting capacitance to the load capacitance by said gate circuit.

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**4,382,195**

**MONOLITHICALLY INTEGRABLE SEMICONDUCTOR CIRCUIT**

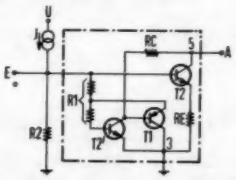
**Günter Pohl, Krailling, and Gerald Mundel, Gloan, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Nov. 19, 1980, Ser. No. 208,319**

**Claims priority, application Fed. Rep. of Germany, Nov. 26, 1979, 2947599**

**Int. Cl.³ H03K** *3/33, 3/353;* **H01L** *27/02*

**U.S. Cl. 307—280** **2 Claims**



1. Monlithically integrable semiconductor amplifier circuit, comprising a first bipolar power transistor, a transistor being complementary to said first transistor, a further transistor being of the same type as said first transistor, a signal input of the circuit being directly connected to the base of said first transistor, a signal output of the circuit being directly connected to the collector of said first transistor, a first resistor connected between the collector of said first transistor and the base of said complementary transistor as well as the collector of said further transistor, at least one reference potential source, a second resistor connected between said at least one reference potential source and said signal input, two resistors being connected together in series with a divider point disposed therebetween, said series connected resistors being connected between said signal input and the base of said further transistor, the emitter of said complementary transistor being directly connected to said divider point, a circuit node, and a third resistor connected between said circuit node and the emitter of said first transistor, the emitter of said further transistor, the collector of said complementary transistor and said at least one reference potential source each being connected to said circuit node.

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**4,382,196**

**TAPE TRANSDUCER**

**G. Kirby Miller, Saratoga, and Jon Becker, Milpitas, both of Calif., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Mar. 16, 1981, Ser. No. 244,492**

**Int. Cl.³ H04R** *19/00;* **G08B** *13/16*

**U.S. Cl. 307—400** **6 Claims**

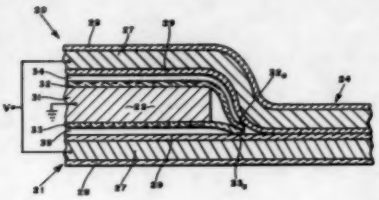
1. A composite tape transducer comprising

a metallic inner strip,

said inner strip having electrically charged dielectric layers bonded to opposite sides, respectively, thereof,

a pair of metallic outer strips adjacent to and movable toward and away from said layers, respectively,

each of said outer strips having widths greater than the width of said inner strip,



said outer strips having marginal edge portions extending beyond the side edges, respectively, of the inner strip, and

means to secure together adjacent marginal portions of said outer strips.

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**4,382,197**

**LOGIC HAVING INHIBIT MEAN PREVENTING ERRONEOUS OPERATION CIRCUIT**

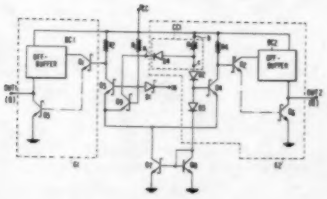
**Noboru Kiyozuka, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Jul. 30, 1980, Ser. No. 173,540**

**Claims priority, application Japan, Jul. 31, 1979, 54-97802**

**Int. Cl.³ H03K *3/26***

**U.S. Cl. 307—470** **9 Claims**



1. A logic circuit comprising a current source, first and second transistors, emitters of said first and second transistors being coupled to said current source in common, first means for operatively supplying a base of said first transistor with a reference voltage, a value of said reference voltage making said first transistor conductive, second means coupled to a collector of said second transistor and responsive to a conducting state of said second transistor for inhibiting said first means from supplying said reference voltage thereby to make said first transistor non-conducting, a third transistor having an emitter coupled to the emitter of said second transistor and a base coupled to the base of said second transistor, third means for applying an input signal to the bases of said second and third transistors in common, a first logic circuit coupled to a collector of said third transistor and controlled by the conducting state of said third transistor, and a second logic circuit coupled to a collector of said first transistor and controlled by the conducting state of said first transistor.

**4,382,198**

**AMPLITUDE LIMITER CIRCUIT**

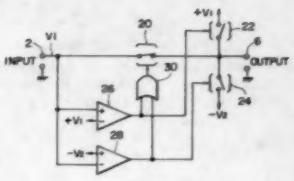
**Yasumori Ishijima, Kodaira, and Rikichi Murooka, Kanagawa, both of Japan, assignors to Tektronix, Inc., Beaverton, Oreg.**

**Filed Dec. 22, 1980, Ser. No. 218,685**

**Claims priority, application Japan, Jan. 9, 1980, 55-513**

**Int. Cl.³ H03K *5/08***

**U.S. Cl. 307—555** **10 Claims**



1. An amplitude limiter circuit, comprising:

an input terminal for receiving an input voltage signal and an output terminal;

switch means connected between said input and output terminals;

control means for maintaining said switch means conducting when said input signal remains within a predetermined limit and non-conducting when said signal exceeds said predetermined limit; and

voltage maintenance means responsive to said control means for maintaining the voltage on said output terminal at said predetermined limit when said switch means is non-conducting.

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**4,382,199**

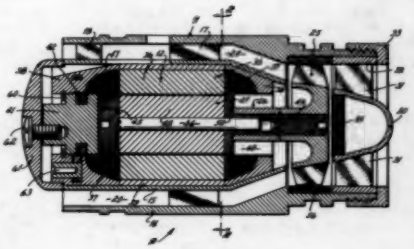
**HYDRODYNAMIC BEARING SYSTEM FOR A BRUSHLESS DC MOTOR**

**Milton S. Isaacson, Dayton, Ohio, assignor to Nu-Tech Industries, Inc., Dayton, Ohio**

**Filed Nov. 6, 1980, Ser. No. 204,624**

**Int. Cl.³ A61F *1/24;* H02K *5/12***

**U.S. Cl. 310—87** **4 Claims**



1. A motor comprising,

a fixed stator having a cylindrical bore providing a bearing surface, said bore being closed at one end,

a cylindrical rotor rotatably and slidably mounted in said bore, forming with said bore a journal bearing,

said rotor having an inner end cooperating with the closed end of said bore to form a thrust bearing,

a fluid between said rotor and said cylindrical bore, including said closed end, said fluid acting hydrodynamically with said thrust bearing and said journal bearing to minimize metal-to-metal contact,

an impeller mounted on said rotor,

means for cyclically reversing the direction of said rotor,

said impeller imparting a greater thrust load toward said closed end of said bore when said impeller rotates in a first direction than the thrust load in the opposite direction when said impeller is reversed,

the outside diameter of said rotor being only slightly less than the inside diameter of said bore, thereby creating a dashpot effect tending to resist said rotor's engagement with the closed end of said bore on reversal of said impeller.

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**4,382,200**

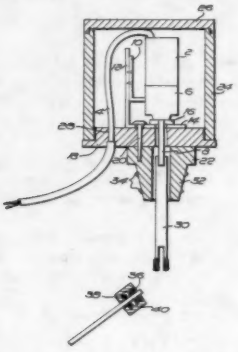
## STIRRER MOTOR SUPPORT

**Lawrence M. Street, c/o Hy-Per-Graph Ltd., Parkfield Mills, Fountain St., Morley, West Yorkshire, England**

**Filed Apr. 10, 1981, Ser. No. 253,955**

**Int. Cl.³ H02K *5/00***

**U.S. Cl. 310—157** **9 Claims**



1. A support assembly for direct, detachable mounting of a stirrer motor upon the necked opening of a vessel for driving engagement with an agitating means in said vessel, said support assembly comprising:

A. housing means for supporting said stirrer motor;

B. an opening in said housing means to receive the driving shaft of said stirrer motor;

C. tapering attachment means for removably mounting in the necked opening of said vessel, said attachment means having a bore therethrough and connected with said housing means on the outer surface thereof and positioned on said housing means so that said bore and said opening are in axial alignment;

D. said attachment means providing sole support for said housing means and said stirrer motor upon said vessel.

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**4,382,201**

## ULTRASONIC TRANSDUCER AND PROCESS TO OBTAIN HIGH ACOUSTIC ATTENUATION IN THE BACKING

**Casmir R. Trzaskos, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 27, 1981, Ser. No. 258,226**

**Int. Cl.³ H04R *17/00***

**U.S. Cl. 310—327** **5 Claims**

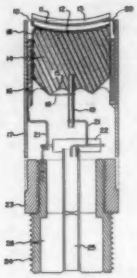
1. A process for enhancing the acoustic attenuation of a tungsten-polyvinyl chloride ultrasonic transducer backing material comprising:

placing a mixture of tungsten powder and polyvinyl chloride powder into the chamber of a high pressure die, said tungsten powder having a particle size less than 10 microns and the volume ratio of tungsten to polyvinyl chloride being selected to yield a specific acoustic impedance;

evacuating the die chamber to degas said powders;

heating said powder mixture for a limited time and applying a pressure that is increased to a high pressure sufficient to compress said powders into a dense, compact composite;

continuing to apply said high pressure until said composite cools down to below 50° C. and is in a state of elastic compression; and



removing said cooled composite from the die so that said composite spontaneously expands and acquires high levels of acoustic attenuation.

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**4,382,202**

## PIEZOELECTRIC LOADING DEVICE

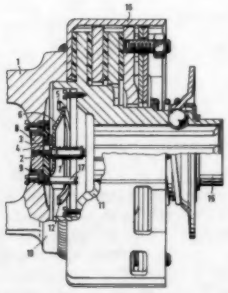
**Paul Herchenbach, Ruppichteroth, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany**

**Filed Aug. 25, 1981, Ser. No. 296,073**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032961**

**Int. Cl.³ H01L *41/00***

**U.S. Cl. 310—328** **7 Claims**



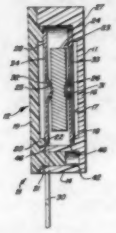
1. A device for loading a piezoelectric element to give an electrical signal upon relative rotation occurring between two members comprising: a loading element mounted with said piezoelectric element on one of said members; and a control element mounted on the other of said members, said control element including cam surface means engaging said loading element to cause said loading element to load said piezoelectric element; said cam surface means being effective to load said piezoelectric element upon relative rotation between said two members in both a clockwise direction and a counterclockwise direction.

4,382,203

## HOUSING AND SPRING SUPPORT FOR PIEZOELECTRIC RESONATOR

Charles T. Tribby; Arthur H. Clawson, Jr., and Charles D. Clawson, all of Attica, Ind., assignors to Radio Materials Corporation, Attica, Ind.

Filed Nov. 3, 1980, Ser. No. 203,715
Int. Cl.[3] H01L *41/08*
U.S. Cl. 310—355 9 Claims



1. A resonator assembly comprising:

a base defined by an annular sidewall having an outer open end, and a bottom wall closing the opposite end, said bottom wall having a central recess opening outwardly toward said open end and an annular outwardly facing shoulder between said recess and sidewall;

a cap defined by a top wall, an inwardly extending annular flange on the top wall having a radially outer cylindrical surface fitted in the outer end of said base annular sidewall and defining an inwardly facing annular shoulder aligned with said base outwardly facing annular shoulder;

resonator means disposed within said sidewall means and clamped coaxially between said shoulders, said resonator means having a first circular springy contact engaging said outwardly facing shoulder and a second circularly springy contact engaging said inwardly facing shoulder, said springy contacts having elongated terminals extending endwise therefrom, said base sidewall having a first outwardly opening notch defining an inner end spaced from the outer end of the sidewall a distance substantially equal to the axial height of said cap flange and thickness of one of said terminals extending outwardly therethrough, said cap having a first axially inwardly projecting terminal retainer received in said notch and having an axial length substantially equal to the axial depth of said notch less the thickness of said one terminal to clamp the terminal between said base and cap with its springy contact centered therein, said base sidewall having a second outwardly opening notch defining an inner end spaced from the outer end of the sidewall a distance substantially equal to the axial height of said base sidewall, the other of said terminals extending outwardly therethrough, said cap having a second axially inwardly projecting terminal retainer received in said second notch and having an axial length substantially equal to the axial depth of said second notch less the thickness of said other terminal to clamp said other terminal between said base and cap with its springy contact centered therein, both said projecting terminal retainers being fitted into said notches to further define means for holding the cap to the base; and

frictional interlocking securing means on said base and cap intermediate said terminal retainers, said fitted retainers and the interlocked securing means defining an effectively positive means for preventing separation of the cap from the base by forces acting on the exposed terminals in normal use of the resonator assembly, said interlocked securing means comprising an elongated projection on said cap extending parallel to said inwardly projecting terminal retainers and firmly into a complementary outwardly opening securing recess in said base whereby outward urging of a terminal in its notch is counteracted by resistance of said projection to become angularly disaligned with the securing recess as well as by frictional retention of said terminal retainers in said notches and securing means projection in said securing recess.

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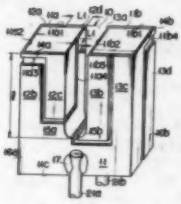
4,382,204

## TUNING FORK-SHAPED QUARTZ OSCILLATOR

Hiroshi Yoda, Tokyo, Japan, assignor to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1980, Ser. No. 208,065
Claims priority, application Japan, Nov. 22, 1979, 54-162163[U]
Int. Cl.[3] H01L *41/08*
U.S. Cl. 310—366 13 Claims



1. A tuning fork-shaped quartz oscillator comprising:

a U-shaped quartz oscillator body comprising a pair of vibration arms having a substantially rectangular cross section and a base connected to said vibration arms at one end of said vibration arms;

first and second excitation electrodes provided on the sides of each of said vibration arms, said first and second excitation electrodes each including first and second electrode portions, wherein for each vibration arm said first electrode portion of said first excitation electrode and said first electrode portion of said second excitation electrode being provided on each side of a vibration arm parallel to the direction of the bending mode vibration of the vibration arm, said second electrode portion of said first excitation electrode being contiguous to said first electrode portion thereof, said second electrode portion of said first excitation electrode being laid on one side of the vibration arm adjacent to the side on which the first electrode of said first excitation electrode portion is laid, and said second electrode portion of said second excitation electrode being contiguous to said first electrode portion of said second excitation electrode, said second electrode portion of said second excitation electrode being laid on the other side of the vibration arm adjacent to the side on which said first electrode portion of said second excitation electrode is laid; and

connecting means including a first input terminal and a second input terminal coupled to said excitation electrodes for supplying drive voltage to said excitation electrodes for causing said vibration arms to keep vibrating in opposite phase relation in both a bending mode and a twisting mode.

4,382,205

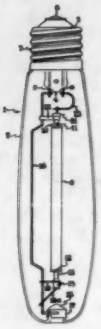
## METAL VAPOR ARC LAMP HAVING THERMAL LINK DIMINISHABLE IN HEAT CONDUCTION

Jack M. Strok, Jr., Garrettsville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 183,250, Sep. 2, 1980, abandoned. This application Dec. 31, 1980, Ser. No. 221,839

Int. Cl.³ H01J 61/30, 61/52, 9/42

U.S. Cl. 313—25 13 Claims



1. An arc discharge lamp comprising:

an outer vitreous envelope having a pair of lead-in conductors sealed into it,

an arc tube supported within said outer envelope and connected to said lead-in conductors,

an ionizable medium sealed within said arc tube and including vaporizable metal in a quantity exceeding that vaporized during operation, the heat balance in said lamp determining a cold spot in said arc tube whereat excess metal collects, and the temperature of said cold spot determining the metal vapor pressure in said arc tube and the voltage drop across it,

a metal member in said lamp the heat loss from which influences significantly the temperature of said cold spot,

and a thermal link to said metal member influencing said heat loss, said thermal link being arranged for convenient diminution in effective cross section in the completed lamp by coupling energy thereinto through the wall of said outer envelope, such diminution serving to increase said voltage drop.

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4,382,206

## DIRECTLY HEATED TYPE OXIDE CATHODE

Masaharu Kumada, and Akira Misumi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,730

Claims priority, application Japan, Sep. 12, 1979, 54/116069

Int. Cl.³ H01J 1/14

U.S. Cl. 313—346 R 12 Claims

1. A directly heated type oxide cathode comprising a base made of an alloy containing Ni as a major component and Zr as a reducing agent, a diffusion prevention layer made of Co or Co-Ni alloy containing Co in an amount of more than 80% by weight formed on the base, a coating of Ni powders formed on the diffusion prevention layer, and an electron emissive alkaline earth oxide layer formed on the coating of Ni powders, whereby said diffusion prevention layer can prevent diffusion of Zr into said Ni powders.

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4,382,207

## LUMINESCENT MATERIAL AND DISCHARGE LAMP CONTAINING THE SAME

Judicus M. P. Jan Verstegen; Johannus G. Verlijsdonk; Emiel P. J. de Meester; Willebrordus H. M. M. Van de Spijker, and Johannes G. Verriet, all of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 876,826, Feb. 10, 1978, Pat. No. 4,216,408, which is a continuation of Ser. No. 699,344, Jun. 24, 1976, abandoned, which is a continuation of Ser. No. 410,104, Oct. 26, 1973, abandoned. This application Apr. 28, 1980, Ser. No. 144,731

Claims priority, application Netherlands, Nov. 3, 1972, 7214862

Int. Cl.³ C09K 11/475; H01J 1/63, 29/20

U.S. Cl. 313—486 4 Claims

1. A luminescent material having a hexagonal crystal structure corresponding to β-alumina, β''-alumina; or the hexagonal ferrites, said luminescent material being activated by cerium and terbium, and having a composition comprising a compound of the formula

$$La_{1-x-y}Ce_xTb_yMgAl_{11}O_{19},$$

wherein

$0.20 \leqq x \leqq 0.80$

$0.10 \leqq y \leqq 0.40$

$x+y \leqq 1.0$.

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4,382,208

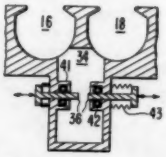
## VARIABLE FIELD COUPLED CAVITY RESONATOR CIRCUIT

Gard Meddaugh, Mountain View; Eiji Tanabe, Sunnyvale, and Victor Vaguine, Palo Alto, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 28, 1980, Ser. No. 172,918

Int. Cl.³ H01J 25/10

U.S. Cl. 315—5.41 22 Claims




1. In an accelerator for accelerating a particle beam, a resonant chain of electromagnetic cavities coupled in series and resonant at approximately the same frequency, one of said cavities being coupled to each of two adjacent cavities, and adjustable means for changing the distribution of electromagnetic field within said one cavity such that the magnitude of the field coupling between said one cavity and a first of said adjacent cavities is substantially varied with respect to the magnitude of the field coupling between said one cavity and the second of said adjacent cavities, while maintaining substantially said approximately same frequency and without causing a change in the phase of the field in said one cavity.

17. A particle accelerator having a chain of electromagnetic cavities comprising at least two accelerating cavities, said accelerating cavities having holes through their walls for passage of a beam of charged particles and being coupled to said beam, said chain of cavities also having at least one coupling cavity which is substantially uncoupled from said beam and electromagnetically coupled to each of said two accelerating

cavities, said coupling cavity having two reentrant conductor posts, adjustment means for changing the distribution of the electromagnetic field within said coupling cavity such that the magnitude of the field coupling between said coupling cavity and one of said accelerating cavities is greater than the field coupling between said coupling cavity and the other of said acceleration cavities, said adjustment means comprising at least one movable adjustment member in said coupling cavity and located externally of said conductor posts, and means for positioning said adjustment member asymmetrically with respect to said conductor posts.

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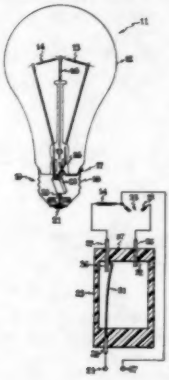
**4,382,209**

## THERMAL SWITCH AND DUAL FILAMENT LONG LIFE LAMP

**Nicholas Loucaides, Lyndhurst, Ohio, assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 6, 1980, Ser. No. 194,369**
**Int. Cl.³ H05B *39/10***
**U.S. Cl. 315—65** **10 Claims**



1. A three-terminal switch having a common member biased against a side of a first terminal of fusible material, and a second terminal spaced from said first terminal, said first terminal being subject to melting or deforming upon overcurrent, whereby said common member is urged to move into contact with said second terminal.

3. A switch as claimed in claim 1, in combination with a dual filament light bulb having first and second filaments, means connecting a first power connection to said common member, means connecting a second power connection to an end of each of said filaments, means connecting said first terminal to the remaining end of said first filament, and means connecting the second terminal to the remaining end of said second filament.

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**4,382,210**

## BALLAST CIRCUIT FOR DIRECT CURRENT ARC LAMP

**Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Dec. 18, 1981, Ser. No. 332,065**
**Int. Cl.³ H01J *7/44*; H05B *37/00***
**U.S. Cl. 315—073** **9 Claims**

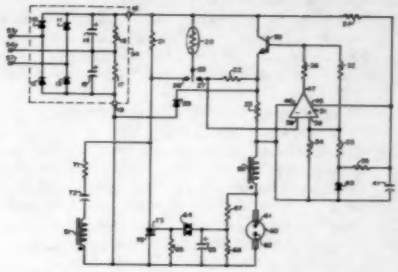
1. A combination discharge, incandescent lamp assembly including a miniature arc discharge lamp, an incandescable filament, and a thermal switch having break and make contacts mounted within a sealed outer envelope, and a control circuit in a common assembly arranged to operate from an alternating current source, said control circuit comprising:

rectification means, having a pair of output terminals, for converting an input alternating current to a direct current across said output terminals;

a first series circuit connected across said direct current output terminals, said first series circuit including said incandescable filament, said break contacts of said thermal switch, a first inductor, and said discharge lamp, said break contacts being closed until said discharge lamp reaches a predetermined operating temperature;

a controlled rectifier connected in series with said make contacts of said thermal switch across said output terminals, said make contacts being closed when said discharge lamp reaches said predetermined operating temperature;

a second series circuit connected in parallel with said controlled rectifier, said second series circuit including a capacitor and a second inductor magnetically coupled to



said first inductor said circuit receiving charge from said direct current output terminals;

a gate control circuit connected in parallel with said discharge lamp and responsive to lamp voltage and to a gate of said controlled rectifier for causing said controlled rectifier to periodically conduct upon energization of the control circuit to cause pulses to be coupled from said second inductor across said first inductor to boost the voltage across said discharge lamp for igniting the same and for causing said controlled rectifier to cease conducting upon initiation of an arc mode in said discharge lamp, and for causing said controlled rectifier to conduct to cause current flow through said incandescable filament when discharge in said discharge lamp is extinguished and said make contacts are closed.

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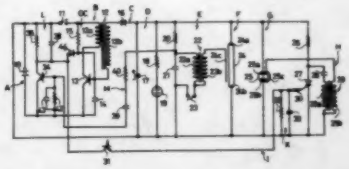
**4,382,211**

## ELECTRIC FLASH DEVICE

**Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan**

**Filed Nov. 7, 1980, Ser. No. 204,797**
**Claims priority, application Japan, Nov. 7, 1979, 54-144712; Nov. 30, 1979, 54-155005**
**Int. Cl.³ H05B *41/32***
**U.S. Cl. 315—151** **16 Claims**



1. An electric flash device comprising:

electric power supplying means for supplying electric power to a load;

electrical energy storing means for storing electrical energy supplied from said electric power supplying means;
flash light generating means for converting the electric energy stored in said electrical energy storing means to light energy;
trigger signal generating means for triggering said flash light generating means;
flash light control means for controlling the quantity of flash light;
driving power source means for actuating said flash light control means; and
control means for controlling said driving power means;
wherein said electric power supplying means comprises a direct current power source circuit for converting a direct current voltage to an alternating current voltage, and a rectifier circuit for rectifying the alternating current voltage to a direct current voltage;
said electric energy storing means comprises an electric charge storing circuit including a main storage capacitor for storing electric charge from said rectifier circuit;
said flash light generating means comprises a flash tube circuit including a flash tube;
siad trigger signal generating means comprises a triggering circuit for triggering said flash tube;
said flash light control means comprises a control circuit for stopping the flash operation of said flash tube of the flash light generating means, a control signal generating circuit for actuating said control circuit, and a light measuring circuit for sensing a reflecting light which is produced by said flash tube and is reflected from an object to be photographed for actuating said control circuit;
said driving power source means comprises a driving power source circuit including a switch element (**34**) for enabling said battery of the direct current power source circuit to supply electrical energy from said battery to said light measuring circuit;
said switch element being conductive to supply electric power at least during the activation of said flash tube circuit;
said control means controlling said driving power source means to control said switch element at least during the activation of said flash tube circuit, said control means having voltage stabilizing means for preventing voltage instabilization due to the operation of a switching element of an oscillator circuit of said converter circuit during the activation of said flash tube circuit and for stabilizing the voltage applied to said light measuring circuit.

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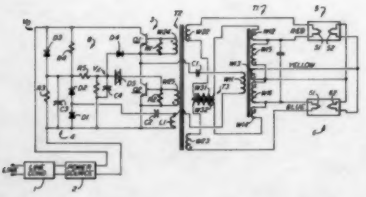
**4,382,212**

## ONE LAMP OUT DETECT SHUTDOWN TECHNIQUE FOR HIGH FREQUENCY, SOLID STATE FLUORESCENT LAMP BALLASTS

**David L. Bay, Muncy, Pa., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Feb. 9, 1981, Ser. No. 232,608**
**Int. Cl.³ H05B *41/29***
**U.S. Cl. 315—225** **9 Claims**



2. In an electronic ballast system including an inverter circuit for driving at least a pair of lamps, a transformer output configuration comprising:
a primary coupled to the inverter output, and
a secondary including:
a first series connection including a
first filament winding, a first feedback winding, and a first winding of a differential transformer, said windings adapted to be coupled in a first circuit loop with a first lamp filament and
a second series connection including a second filament winding, a second feedback winding and a second winding of the differential transformer, said windings adapted to be coupled in a second circuit loop with a second lamp filament whereby removal of at least one of the lamp filaments inhibits operation of the inverter.

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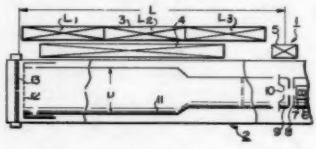
**4,382,213**

## IMAGE PICKUP APPARATUS

**Motoji Kajimura; Hiroyuki Echigo, and Yoshiaki Hashizume, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Continuation of Ser. No. 924,901, Jul. 13, 1978, abandoned. This application Feb. 24, 1981, Ser. No. 237,725**
**Claims priority, application Japan, Aug. 26, 1977, 52/101702; Sep. 13, 1977, 52/109464**
**Int. Cl.³ H01J *29/66, 31/26***
**U.S. Cl. 315—382** **12 Claims**



1. An image pickup apparatus comprising:
an image pickup tube including a focusing electrode, a target and an electron beam limiting aperture for limiting the diameter of an electron beam, the distance between said target and said electron beam limiting aperture being at least 5.5 times the maximum diameter of said focusing electrode; and
a yoke assembly means surrounding said pickup tube including means for generating a deflection magnetic field and means for generating a focusing magnetic field, the half value width of the intensity distribution of said focusing field along the axis of said image pickup tube being at least 85 percent of the distance between said target and said electron beam limiting aperture, and the intensity of said focusing field in an intermediate position between said target and said electron beam limiting aperture being smaller than the focusing magnetic field intensity both near the target and near said electron beam limiting aperture to form two intensity peaks.

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**4,382,214**

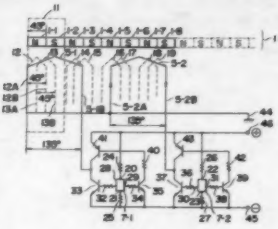
## DIRECT CURRENT MOTOR

**Itsuki Ban, 829 Higashi Oizumimachi, Nerima-ku, Tokyo, and Manabu Shiraki, 4451-171 Shimotsuruma, Yamatoshi, Kanagawaken, both of Japan**

**Filed Nov. 7, 1980, Ser. No. 204,914**
**Claims priority, application Japan, Nov. 13, 1979, 54-146059**
**Int. Cl.³ H02K *29/00***
**U.S. Cl. 318—254** **4 Claims**

1. In a direct current motor comprising a field magnet having multiple magnetic poles and an armature having a plurality of armature windings, the improvement wherein said field magnet has at least four magnetic poles and the angular spacing is equal to 360 degrees divided by the number of the magnetic poles, and at least one of said armature windings has an angular

spacing which is (2n−1) times the width of said field magnetic pole, where n is a positive integer of 2 or more, and control



means for successive switching, rendering said armature windings conductive, is provided.

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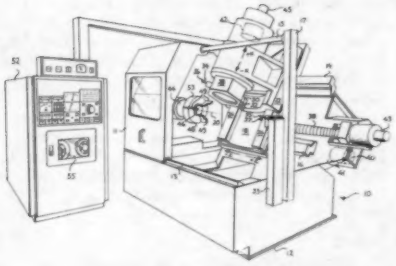
**4,382,215**

**SYSTEM AND METHOD OF PRECISION MACHINING**

**Allan R. Barlow, Georgetown, and William A. Hunter, Danvers, both of Mass., assignors to General Electric Company, Salem, Va.**

**Filed Jul. 16, 1981, Ser. No. 283,850**
**Int. Cl.³ G05B *19/42***
**U.S. Cl. 318—568** **12 Claims**
**MICROFICHE APPENDIX INCLUDED**
**(2 Microfiche, 87 Pages)**



**1.** A method for automatically machining at least one surface of a work piece to precise, selectively determined dimensions by the use of a closed loop numerically controlled machining system;

said system comprising programmable computer numerical control means adapted to operate under the direction of a machining program which includes said selectively determined dimensions, machining apparatus including a stationary bed, work piece holding means, and tool holding means adapted to carry one or more tools and to place selected ones of said tools into operating position, means for providing relative motion between the selected tool and said work piece when each is mounted in its respective holding means, said tool being adapted to effect the removal of material from said work piece during said relative motion when a cutting edge of said tool bears against said work piece, means controlled by said numerical control means for positioning said holding means relative to each other at least in first and second axes of motion of said machining apparatus, position feedback means adapted to indicate to said numerical control means the relative position of said respective holding means at least in said first and second axis respectively, position reference means associated with said machining apparatus and including at least a pair of reference surfaces each corresponding to a separate one of said axes, each of said reference surfaces providing a calibrated position reference with respect to the origin position of said program, a first contact probe adapted to be mounted in a tool holding location of said tool holding means, and a second contact probe mounted with its probe tip accessible for contact by the tip of said first probe and by said cutting edge respectively, each of said contact probes being adapted to provide an indication to said numerical control means when the tip of said probe makes contact with a surface;

said method comprising the steps of:

(1) placing said first probe into operating position in said tool holding means;

(2) probing said at least first and second reference surfaces with said first probe to calibrate the position of its probe tip at least in said first and second axes, said reference surface probing operation including the steps of positioning said respective holding means relative to each other in each of said axes until said first probe tip individually establishes contact with the reference surface corresponding to each axis;

(3) storing a first set of deviations in said numerical control means each determined by the difference along one of said axes between the programmed position of said first probe tip for contact with a reference surface in said axis and its actual contact position derived from the concurrently indicated position feedback;

(4) probing the tip of said second contact probe with said first probe to calibrate the position of said second probe tip at least in said first and second axes, the last-recited probing operation including the steps of positioning said respective holding means relative to each other in each of said axes until said first probe tip establishes contact with said second probe tip individually along each axis;

(5) storing a second set of deviations in said numerical control means each determined by the difference along one of said axes between the programmed position of said first probe tip for contact with said second probe tip in said axis and the corresponding actual contact position of said first probe tip derived from the concurrently indicated position feedback;

(6) placing a selected tool into operating position in said tool holding means;

(7) probing said second probe tip with said cutting edge of said selected tool to calibrate the position of said cutting edge at least in said first and second axes, said edge probing operation including the steps of positioning said respective holding means relative to each other in each of said axes until said cutting edge establishes contact with said second probe tip individually along each axis;

(8) storing a third set of deviations in said numerical control means each determined by the difference along one of said axes between the programmed position of said cutting edge for contact with said second probe tip in said axis and its actual contact position derived from the concurrently indicated position feedback;

(9) storing a first set of compensating offsets for said selected tool in said numerical control means determined by one of each said first, second and third sets of deviations for each axis;

(10) machining said work piece in accordance with said program modified by said first set of offsets to provide a semi-finished surface on said work piece;

(11) placing said first probe into operating position in said tool holding means;

(12) probing said semi-finished surface with said first probe at least in one of said axes, said last-recited probing operation including at least the step of positioning said respective holding means relative to each other in said axis until said first probe tip establishes contact with said semi-finished surface;

(13) storing a fourth set of deviations in said numerical control means each determined by the difference along one of said axes between the originally programmed position of said first probe tip for contact with said semi-finished

surface in said axis and its actual contact position derived from the concurrently indicated position feedback;

(14) storing a set of offset ocrrections for said selected tool in said numerical control means determined at least in part by one of said fourth set of deviations for each axis;

(15) storing a final set of compensating offsets for said selected tool in said numerical control means determined by one of each of said first set of offsets and said set of offset corrections for each axis;

(16) placing a selected tool into operating position in said tool holding means; and

(17) machining said work piece in accordance with said program modified by said final set of offsets to provide said finished surface.

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## 4,382,216

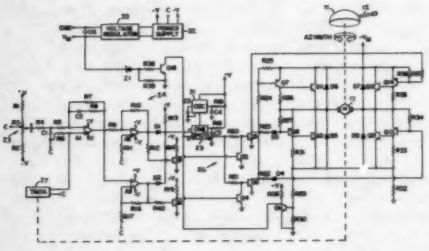
## SYSTEM FOR CONTROLLING THE MOVEMENT OF A ROTATABLE MEMBER

**Craig L. Joseph, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.**

**Continuation of Ser. No. 4,530, Jan. 18, 1979. This application Nov. 30, 1981, Ser. No. 326,104**

**Int. Cl.³ G05B *11/01***

**U.S. Cl. 318—630** **4 Claims**



1. A system for controlling the position of a gun turret movable about an azimuth axis, wherein a rapid fire gun having a rapid fire period is mounted in the turret displaced laterally from the azimuth axis, comprising

an azimuth drive motor,

a single azimuth gear driven by said azimuth drive motor,

a ring gear meshed with said single azimuth gear and disposed so that when said drive motor is energized the turret rotates about the azimuth axis, the reflected moment of inertia of said drive motor and single azimuth gear being at least two orders of magnitude less than the turret moment of inertia about the azimuth axis,

an angular velocity sensor mounted to provide a signal indicative of the rate of turn of the turret about the azimuth axis,

a command control accessible to an operator for providing an azimuth input velocity command signal,

single means for comparing and for integrating the difference between said input command signal and said rate of turn signal and for providing an error signal responsive to said integration,

and means for coupling said error signal to said azimuth drive motor so that angular position error due to torque input about the azimuth axis caused by firing of the laterally displaced gun in the turret is corrected within the rapid fire period.

## 4,382,217

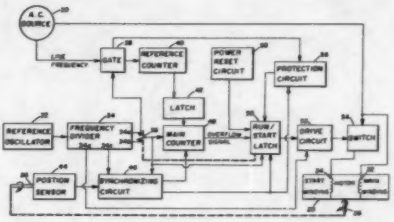
## STARTING CONTROL CIRCUIT FOR AN A.C. MOTOR

**George W. Horner, St. Louis, and Vern J. Alway, Ferguson, both of Mo., assignors to Gould Inc., Rolling Meadows, Ill.**

**Filed May 15, 1981, Ser. No. 263,967**

**Int. Cl.³ H02P *1/42***

**U.S. Cl. 318—778** **36 Claims**




1. A starting control circuit for an alternating current motor having a run winding and a start winding and a mechanical rotational output comprising:

an alternating current source;

reference means for producing a reference signal;

first control means responsive to said reference signal and the frequency of said alternating current source for producing a first control signal;

sensor means for sensing a predetermined amount of rotational movement of said mechanical rotational output and producing a sensor signal indicative thereof;

second control means responsive to said reference signal and said sensor signal for producing a second control signal and for comparing said first and second control signals and assuming first and second output states dependent on the relationship between said first and second control signals; and

switch means connected to said second control means, said alternating current source and said start winding, for connecting and disconnecting said alternating current source and said start winding in response to the output state of said second control means.

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## 4,382,218

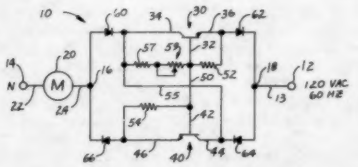
## SPEED CONTROL FOR FAN MOTOR

**Charles W. McVey, Chardon, Ohio, assignor to Stratford Manufacturing, Inc., Chardon, Ohio**

**Filed Jun. 30, 1982, Ser. No. 393,747**

**Int. Cl.³ H02P *7/36***

**U.S. Cl. 318—812** **4 Claims**




1. In combination with an alternating current power source and a multipole induction motor driving a generally constant load, a control circuit for varying the speed of the motor comprising:

a pair of transistors connected in anti-parallel relationship with each other and being series-inserted between the source and the motor wherein alternating current pulses of like polarity flow through one or the other of the transistors to power the motor, the transistors functioning in

push-pull manner wherein each transistor carries approximately one-half of the motor current;

transistor biasing means adjustable by the motor user to set the conductivity of the transistors at a predetermined level to regulate the amount of power applied by the source to the motor via the transistors, the speed of the motor being determined by the degree of its pole slippage which is generally proportional to the applied power; and

diode means in series with the transistors to preclude application of reverse current to the transistors.

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**4,382,219**

## ARRANGEMENT CONSISTING OF A BATTERY HANDLE FOR ELECTRO-OPTICAL DIAGNOSTIC INSTRUMENTS, OF A CHARGER AND OF A STORAGE CELL

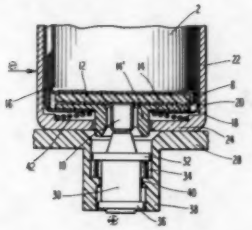
**Helmut A. Heine; Otto H. Schmidt, and Hans J. Spitschan, all of Herrsching, Fed. Rep. of Germany, assignors to Heine Optotechnik GmbH & Co. KG, Herrsching, Fed. Rep. of Germany**

**Filed Dec. 11, 1980, Ser. No. 215,558**

**Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007831**

**Int. Cl.³ H02J 7/00; F21L 9/00; H01M 10/44**

**U.S. Cl. 320—2** **3 Claims**



1. A system comprising the combination of a battery handle for electro-optical diagnostic instruments, said handle housing a storage cell, one end face of said handle being provided with an aperture, said handle having a casing at least a portion of the outside surface of which is electrically conductive, charger means for charging said storage cell, having a connecting pin, said charger means being connected to said battery handle in a charging position, whereby said pin projects into the aperture of the battery handle, and said storage cell having a positive pole which protrudes from an end face thereof and, when housed in said battery handle, projects into the aperture thereof, characterized in that

said handle casing has an end wall portion which defines said aperture, said connecting pin of the charging means is movable in the axial direction and is elastically pre-tensioned in the direction of said battery handle, and means limiting the movement of said pin into said aperture by a distance which is smaller than the axial extent of said end wall portion of said battery handle, and storage cell having a contact ring surrounding said positive pole and a negative electrode connected to said contact ring, and connecting means for connecting said electrically conductive part of said battery handle casing to said contact ring, and

a conical compression spring which is arranged concentrically in said battery handle aperture, said spring acting in the axial direction and having a diameter which corresponds, at the end located inside, to that of said contact ring.

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**4,382,220**

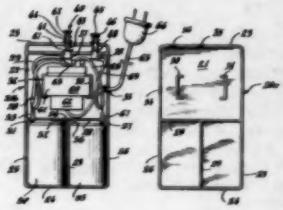
## RECHARGEABLE BATTERY PACK AND COMBINATION THEREOF WITH LANTERN

**Francis G. Marshall, Meriden, and Ralph F. Moore, Greenwich, both of Conn., assignors to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.**

**Filed Jul. 20, 1981, Ser. No. 284,989**

**Int. Cl.³ H02J 7/00**

**U.S. Cl. 320—2** **13 Claims**



1. A rechargeable battery pack comprising a case having two terminals extending therethrough for exterior access and having mounted therein at least one rechargeable battery, an AC-DC transformer for charging the battery and wiring connecting the battery to the two terminals extending through the case for drawing current and connecting the battery to the DC side of the transformer for charging, the wiring including a line cord extending from the AC side of the transformer through the case and terminating in a plug connector for insertion into a standard wall outlet, wherein the two terminals extending through the case each comprises an enlarged head positioned outside the case, a shaft extending through an opening in the case and an enlarged foot positioned inside the case and thereby securing the terminal to the case, and a coil spring deployed between the outer surface of the case and the head of the terminal, whereby the two terminals are biased outwardly from the case and yield into spring biased contact with contact strips, contact plates or the like of devices in which the rechargeable battery pack is utilized.

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**4,382,221**

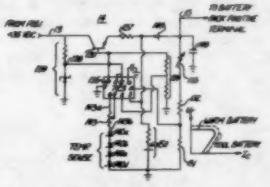
## BATTERY CHARGER FOR A BACKUP POWER CIRCUIT

**William R. Reynolds, c/o Electronic Systems & Components, Inc., 110 Summit Ave., Chatham, N.J. 07928**

**Division of Ser. No. 103,735, Dec. 14, 1979. This application Jun. 12, 1981, Ser. No. 272,948**

**Int. Cl.³ H02J 7/04**

**U.S. Cl. 320—35** **3 Claims**



1. A temperature-compensated battery charger comprising:

a battery charger circuit providing increasing current to a charging battery as its terminal voltage increases until the terminal voltage reaches a predetermined value wherein the charging current decreases to a minimum amount, the predetermined value of terminal-voltage and the amount of charging current per unit of increasing terminal voltage applied by the charger circuit to the charging battery being varied by a control voltage input to the battery charger circuit; and

sensing means responsive to the battery temperature, the sens-

ing means providing the control voltage input to the battery charger circuit, wherein the predetermined value of terminal voltage and the amount of charging current per unit of terminal voltage applied by the charger circuit to the charging battery is varied in accordance with and is a function of the temperature of the charging battery, the battery charger circuit providing a temperature-stable reference voltage output, the sensing means being connected to the reference voltage output, the interconnecting junction of the reference voltage output and the sensing means providing the control voltage input to the battery charger circuit.

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## 4,382,222
## SERIES REGULATED RECTIFIER CIRCUIT FOR A BATTERY CHARGING SYSTEM

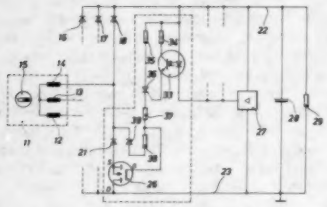
**Wolfgang Kurz, Hemmingen, and Ulrich Munz, Kirchheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed May 14, 1981, Ser. No. 263,356**

**Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019144**

**Int. Cl.³ H02J 7/14; H02P 13/26**

**U.S. Cl. 320—61** **6 Claims**



1. In a battery charging system comprising an alternator, means for rectifying the output of the alternator and a voltage regulator responsive to the rectified voltage for activating and deactivating action corrective of the output voltage, a controlled rectifier circuit responsive to said voltage regulator and comprising:

a bridge rectifier having a first set of rectifier elements serving the positive output terminal and a second set of rectifier elements serving the negative output terminal of said rectifier circuit and having series regulation switching means (26) comprising a MOSFET device interposed in series with each series-regulated rectifier element of at least one of said sets of rectifier elements, and

a set of switching control circuits responsive to the output of said voltage regulator for respectively controlling the said series regulation switching means interposed in circuit with said respective rectifier elements, each circuit of said set of circuits including a thyristor (36) for control of one of said MOSFETs (26), the control terminal of said thyristor being connected so as to be responsive to the output of said voltage regulator (27).

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## 4,382,223
## VOLTAGE AND FREQUENCY-CONTROLLED AC WAVE MODIFIER

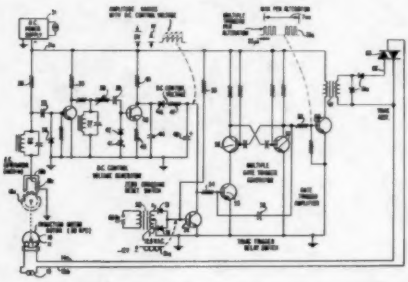
**Rhey W. Hedges, Fort Lauderdale, Fla., assignor to Louis W. Parker, Fort Lauderdale, Fla.**

**Division of Ser. No. 917,698, Jun. 21, 1978, Pat. No. 4,190,793, which is a continuation-in-part of Ser. No. 839,945, Oct. 6, 1977, abandoned. This application May 29, 1979, Ser. No. 43,594**

**Int. Cl.³ G05F 1/455; H02P 7/36**

**U.S. Cl. 323—242** **6 Claims**

1. An AC voltage wave modifier for use in a system of the type comprising an AC power source and an AC load to control the energization of said AC load from said AC power source, said wave modifier comprising controllable AC power switching means having a control terminal for controlling the conductivity of said power switching means, said AC power switching means being connected between said AC power source and said AC load; means for providing an AC reference signal; a multiple trigger pulse generator synchronized to said AC reference signal and operative selectively to produce a continuous train of short duration, rapid rise-time voltage pulses during each cycle of said AC reference signal; means for providing a DC control voltage; means responsive to the amplitude of said DC control voltage for controlling the starting of said multiple trigger pulse generator; means responsive to voltage zero crossings of AC reference signal and operative to terminate said continuous train of trigger pulses from said multiple trigger pulse generator at each of said zero crossings, said last-named means including rectifier means rendered conductive after each of said voltage zero crossings by the increasing voltage of each alternation of said reference signal and rendered nonconductive before each of said voltage zero crossings by the decreasing voltage of each of said alternations, said rectifier means comprising a transistor, a full wave diode assembly energized by said reference signal and having an output connected to the base of said transistor, and a forward



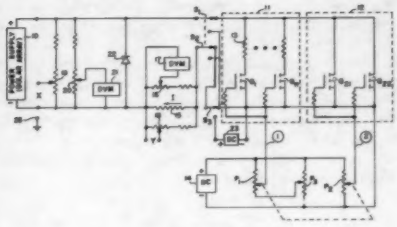
bias voltage source also connected to the base of said transistor, whereby said diode assembly, when conducting, provides a reverse bias voltage opposing said forward bias and operative to keep said transistor cut off until shortly before, during and slightly after said voltage zero crossings of said AC reference signal, and switch means coupled to said transistor and to said multiple trigger pulse generator for turning said multiple trigger pulse generator off and on in accordance with the conductive or nonconductive state of said transistor, whereby said multiple trigger pulse generator produces a plurality of voltage pulses for each cycle of said AC reference signal with the number of said pulses produced being a joint function of the amplitude of said DC control voltage and the frequency of said AC reference signal; and means coupled to the output of said multiple trigger pulse generator for transforming said train of voltage to a continuous stream of current pulses and for coupling said stream of current pulses to said control terminal of said controllable AC power switching means thereby to cause said power switching means to be rendered conductive for a time duration, during each cycle of said AC reference signal, which is a joint function of the amplitude of said DC control voltage and the frequency of said AC reference signal.

4,382,224

## ELECTRONIC SYSTEM FOR HIGH POWER LOAD CONTROL

Emmett L. Miller, Long Beach, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 24, 1980, Ser. No. 219,968
Int. Cl.³ G05F 1/44
U.S. Cl. 323—269 8 Claims



1. A system for control of a plurality of electronic devices in parallel current paths to share a load current from open circuit or high voltage range to short circuit for high current range, with at least one device in each current path, each device having a control terminal, said system comprising

a connection to the control terminal of each device of one group for electronic signal control of said one group of devices in parallel, and a current limiting resistor in series with each device in said one group,

a connection to the control terminal of each device of the remaining devices in another group for electronic signal control of said other group of devices in parallel, and no current limiting resistor in series with each device in said other group,

means for generating a first signal in proportion to a control input for turning on said devices of said one group and increasing their conduction to saturation as said control input increases, and

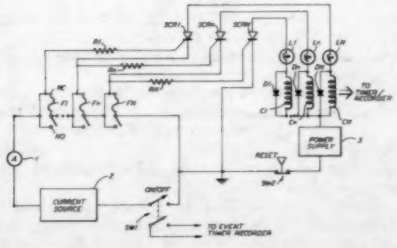
means for generating a second signal in proportion to said control input for turning on said devices of said other group when said devices of said one group reach saturation and increasing their conduction to saturation as said control input increases.

4,382,225

## SIGNAL INDICATING FUSE TESTING APPARATUS

John R. Peltz, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 21, 1981, Ser. No. 226,664
Int. Cl.³ G01R 31/02
U.S. Cl. 324—73 R 18 Claims



1. An apparatus for testing N signal indicating fuses, when N is greater than or equal to 2 the apparatus comprising N test positions, each having a common terminal a normally open terminal, NO, and a normally closed terminal, NC, N indicating means, a current source, and N controllabled switching devices, each having a gate electrode, an anode electrode and a cathode electrode, wherein

(a) the respective NO terminal and NC terminal of each of the N test positions are interconnected,

(b) the NO and NC terminals of the 1st test position are coupled to the current source;

(c) the common terminal of the Nth test position is coupled to a reference potential and the common terminal of each of the remaining n, where $1 \leq n < N$, test position is coupled to the NO and NC terminals of the $(n+1)$th test position;

(d) the gate electrode of each of the N controllable switching devices is coupled to the NC terminal of a respective test position;

(e) the anode electrode of each of the N controllable switching devices is coupled to a respective one of the N indicating means;

(f) the cathode electrode of the Nth controllable switching device is coupled to the reference potential and the cathode electrode of each of the remaining n, where $1 \leq n < N$, controllable switching devices is coupled to the NC terminal of the $(n+1)$th test position.

4,382,226

## ELECTROLYTIC CELL FOR ACTINOMETERS

Shigeru Suga, 5-20-2, Yoyogi Shibuya-ku, Tokyo, Japan (160)

Filed Jan. 11, 1982, Ser. No. 338,653
Int. Cl.³ G01R 11/44
U.S. Cl. 324—94 3 Claims

1. An electrolytic cell for an actinometer comprising:

a glass vessel having a glass filter extending across the central portion thereof and constituting a separator wall dividing the vessel into two side by side chambers;

a body of mercury in the bottom of one chamber and a platinum wire extending into said one chamber and into said body of mercury for forming an anode for said cell;

a carbon plate mounted in the other chamber and having a space defined between said plate and said separator wall and having a hole extending thereinto from the top, mercury substantially filling said hole, and a further platinum wire extending into said mercury in said hole for forming a cathode for said cell, said wires extending through and being sealed to the glass of said vessel;

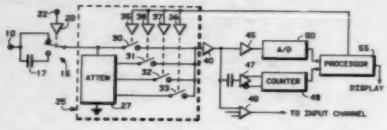
a glass tube extending downwardly from said other chamber for collecting precipitated mercury therein during operation of said cell; and

an electrolyte filling said tube and said chambers and extending to a level just above the upper end of said carbon plate.

## 4,382,227
## MULTIPURPOSE TEST EQUIPMENT INPUT CIRCUITRY

**James E. Olivenbaum, Mesa, and Robert H. Bickley, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Jun. 5, 1980, Ser. No. 156,885**
**Int. Cl.³ G01R *15/08, 1/36***
**U.S. Cl. 324—115** **8 Claims**




1. Multipurpose test equipment input circuitry comprising:
(a) input means including a single input terminal for receiving AC and DC signals;
(b) switching means connected to said input means for selecting one of an AC and DC coupling circuit;
(c) attenuation means connected to said coupling circuits for receiving input signals from said input means and attenuating the amplitude of the input signals to at least a predetermined value;
(d) buffer means connected to said attenuation means for providing a relatively high input impedance at said input means and a relatively low source impedance for circuitry attached to an output thereof, and including circuitry for preventing damage to said buffer means upon the application of greater than a predetermined amplitude of signal to said buffer means, said buffer means including first field effect transistor means providing the relatively high input impedance with current limiting resistance in series with an input gate thereof to provide protection against overloads of a first polarity and second junction field effect transistor means connected as a diode to the input gate to provide protection against overloads of a second polarity; and
(e) a plurality of circuits connected to the output of said buffer means, each of said circuits providing signals for a different function of multipurpose test equipment in response to the application of signals from said buffer means.

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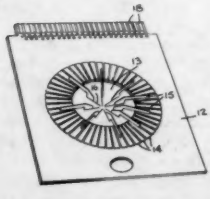
## 4,382,228
## PROBES FOR FIXED POINT PROBE CARDS

**Arthur Evans, Brookfield Center, Conn., assignor to Wentworth Laboratories Inc., Brookfield, Conn.**

**Division of Ser. No. 488,403, Jul. 15, 1974, Pat. No. 3,930,809, which is a division of Ser. No. 390,184, Aug. 21, 1973, Pat. No. 3,849,728. This application Jul. 21, 1975, Ser. No. 597,771**
**The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.**
**Int. Cl.³ G01R *31/02, 1/06***
**U.S. Cl. 324—158 F** **8 Claims**



1. In a probe card apparatus for providing access to an integrated circuit pattern having contacts deployed thereon including, a printed circuit card having an opening therein, spaced conductive pads surrounding the opening wherein the pads are connected by the printed circuit to terminals, and probes each having tips and each having a lower edge soldered to respective pads in a position slightly raised above a respective pad and oriented with respect to a respective pad to position the tips of the probes at a predetermined location with respect to a respective pad, the improvement wherein each probe comprises:
(A) a rigid needle-holding unitary blade having a substantially uniform thickness formed of a strip of metal which is contoured to define an arm whose lower edge is solderable at an oriented position to the selected pad to maintain the position thereof, and a downwardly extending tooth at the free end of the arm disposed within said opening, said blade being relatively thin, whereby a group of probes may be set up on said board in a high density arrangement; and
(B) a resilient metal needle whose shank has a thickness which is close in value to the thickness of the blade, said shank being directly attached to the tooth of the blade and extending forwardly therefrom, whereby the point of the needle which serves as a probe tip is adapted to engage one of said contacts and to be deflected thereby without displacing the blade.

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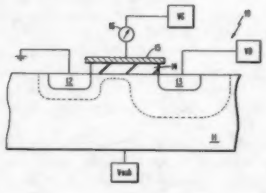
## 4,382,229
## CHANNEL HOT ELECTRON MONITOR

**Peter E. Cottrell, and Ronald R. Troutman, both of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 28, 1980, Ser. No. 210,937**
**Int. Cl.³ G01R *31/22***
**U.S. Cl. 324—158 T** **3 Claims**



1. A method of determining the time to a predetermined threshold shift in an insulating gate field effect transistor due to hot-electron trapping in the gate dielectric comprising:
biasing the gate and drain electrodes of an insulating gate field effect transistor at a constant voltage with respect to the source electrode within the normal operating range, and
measuring the decrease in gate current with respect to time, due to hot electron trapping in the gate dielectric,
wherein there is determined from said measurement the change in channel current and long term device characteristics.

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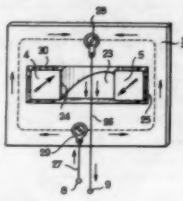
## 4,382,230
## MOVEMENT SENSOR WITH PLATE FORMING SINGLE TURN COILS

**Gerard Gauthier, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Jun. 25, 1980, Ser. No. 162,789**
**Claims priority, application France, Jun. 29, 1979, 79 16904**
**Int. Cl.³ G01B *7/14*; H01F *27/28***
**U.S. Cl. 324—207** **10 Claims**

1. A movement sensor for sensing the movement of a moving part comprising:
a magnetic circuit in the form of a horseshoe with two branches terminating in pole faces defining an air-gap; and
an electric circuit comprising coil means defining a pair of single-turn coils connected in parallel between two connecting terminals, each branch of the magnetic circuit being surrounded by a said single turn coil respectively,

and a ferro-magnetic element integral with the said moving part, one of said magnetic circuit and said element being magnetized for inducing a current in said single-turn coils by the magnetic flux variation caused by the movement in front of the pole faces, said coil means including a flat plate made from a conducting material, and forming the said single-turn coils, the plate having at least one



aperture through which the ends of said branches pass so as to support said magnetic circuit and being connected to said connecting terminals, one of the connections passing between the said branches to provide both a common wire of the parallel connection and a common wire of the said single-turn coils and means for insulating said plate from said magnetic circuit.

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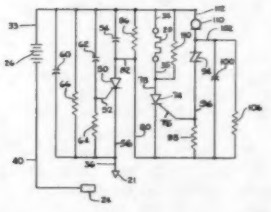
**4,382,231**

## FLUID CONDUCTIVITY SENSOR

**Francis M. Miller, Snyder, N.Y., assignor to Conax Corporation, Buffalo, N.Y.**

**Filed Nov. 17, 1980, Ser. No. 207,340**
**Int. Cl.³ G01N *27/02***
**U.S. Cl. 324—439** **13 Claims**



1. Apparatus for sensing the electrical conductivity of fluid comprising:

(a) a pair of electrodes adapted to be exposed to said fluid;

(b) a voltage source having a pair of terminals, one of said terminals being connected to one of said electrodes;

(c) a three terminal semiconductor device normally in a nonconducting state and adapted to be switched to a conducting state defining a current flow path between two terminals of said device when a voltage of sufficient magnitude is applied to a third terminal of said device;

(d) a load connected electrically in series with the current flow path of said device;

(e) said load and said semiconductor device being connected between the other terminal of said voltage source and the other one of said electrodes; and

(f) a conductivity sensing circuit connected to said other electrode, to said other voltage source terminal and to said third terminal of said semiconductor device, said circuit including means responsive to the electrical conductivity of fluid to which said electrodes are exposed and responsive to the rate of change in electrical conductivity to which said electrodes are exposed for applying to said third terminal of said semiconductor device a voltage of sufficient magnitude to switch said device to said conducting state when the electrical conductivity of said fluid and the rate of change in electrical conductivity each is of a predetermined minimum magnitude thereby allowing a flow of current through said load.

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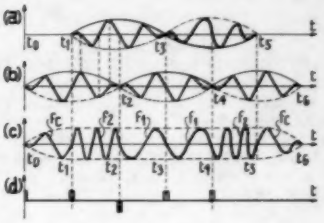
**4,382,232**

## DEVICE FOR DEMODULATING SIGNALS MODULATED BY FREQUENCY-SHIFT KEYING

**Pierre Laurent, Paris, France, assignor to Thomson-CSF, Paris, France**

**Continuation of Ser. No. 55,815, Jul. 9, 1979, abandoned. This application Aug. 12, 1981, Ser. No. 292,338**
**Claims priority, application France, Jul. 12, 1978, 78 20809**
**Int. Cl.³ H03K *3/00***
**U.S. Cl. 329—117** **10 Claims**



1. A device for demodulating signals modulated by frequency shift, said signals being constituted by sequences of n oscillation trains, n being an integer greater than 1, in which each train has one or the other of two given frequencies $F_1$ and $F_2$ and a given time-duration $\tau$, and the sequences being issued from a base sequence of n oscillation trains by circular permutations of the successive values of frequency of the n trains, said sequences being representative of a binary code with n coded sequences having circular permutations, said demodulating device being provided with an input for receiving said coded sequences, an output and first and second filtering channels matched with one of the sequences of n oscillation trains which is called tuning sequence, said filtering channels having respective input channels coupled to the input of said device and a common output channel delivering a response signal for a received sequence, said input channels being time-delayed for producing an increase in the transit time by $n\tau$ in said first filtering channel with respect to the transit time in the second filtering channel, said demodulating device further comprising a detection device having an input coupled to the common output of the filtering channels and an output which is the output of said demodulating device, for detecting in the response signal an instant at which said response signal corresponds to said tuning sequence, said instant being characteristic of said received sequence.

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**4,382,233**

## MULTIPLE-FEEDBACK PATH FILTER

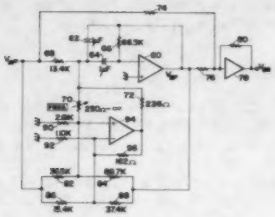
**Bruce E. Hofer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Nov. 12, 1980, Ser. No. 206,114**
**Int. Cl.³ H03F *1/34***
**U.S. Cl. 330—107** **4 Claims**

1. A multiple feedback path filter comprising in combination:

an operational amplifier having a plurality of feedback paths from output to input, said feedback paths including one or more impedance elements;

a single variable-impedance tuning element connected to said operational amplifier; and



means for applying a voltage to said variable-impedance tuning element to effect a nearly constant Q over a predetermined frequency range.

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**4,382,234**

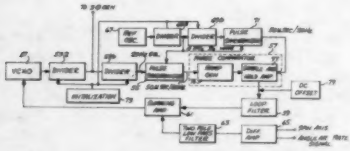
**SLOW ACTING PHASE-LOCKED LOOP WITH EXTERNAL CONTROL SIGNAL**

**Guy R. Olbrechts, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Division of Ser. No. 861,898, Dec. 19, 1977, Pat. No. 4,258,579. This application Oct. 26, 1979, Ser. No. 88,295**

**Int. Cl.³ H03L** *7/08*

**U.S. Cl. 331—10** **8 Claims**



1. A slow acting phase-locked loop adapted to vary the frequency of an output signal in response to control signals having frequency components well above the cut-off frequency of said slow acting phase-locked loop, said slow acting phase-locked loop comprising:

controllable oscillator means for producing a high frequency oscillator signal in response to an oscillation control signal, said controllable oscillator having a linear frequency control law over a very narrow frequency band lying about a nominal high frequency;

divider means connected to said oscillator means for dividing down the frequency of said oscillator signal to produce a low frequency loop signal having a frequency several orders of magnitude lower than the frequency of said high frequency oscillator signal and an output signal having a frequency lying in the range between said high frequency oscillator signal and said low frequency loop signal;

reference signal means for producing a highly accurate and stable low frequency control signal having a frequency the same as the frequency of said low frequency loop signal;

phase comparator means connected to said divider means and to said reference signal means for: (i) receiving said low frequency loop signal produced by said divider means and said highly accurate and stable low frequency control signal produced by said reference signal means; (ii) comparing said low frequency loop signal produced by said divider means and said highly accurate and stable low frequency control signal produced by said reference signal means; and, (iii) producing, in accordance therewith, a loop control signal having a very low magnitude ripple at the frequency of said low frequency control and loop signals and an overall magnitude related to the phase difference between said low frequency loop signal produced by said divider means and said highly accurate and stable low frequency control signal produced by said reference signal means;

loop filter means connected to said phase comparator means for receiving and low frequency filtering in a low phase shift manner said loop control signal; and,

summing means having a first input connected to receive the output of said loop filter means and a second input adapted to receive an external control signal having a frequency component lying above the cutoff frequency of said slow acting phase-locked loop, said summing means summing its input signals and producing an oscillator control signal in accordance therewith, said oscillator control signal applied to said controllable oscillator means for controlling the frequency of the high frequency oscillator signal produced by said controllable oscillator means.

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**4,382,235**

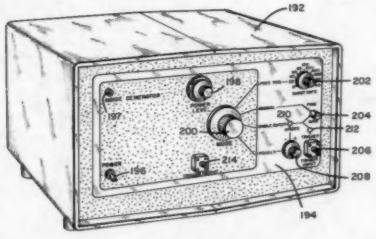
**SIMULATED NOISE GENERATOR**

**Glenn W. Shifflet, St. Louis Park, Minn., assignor to International Control Systems, Inc., Golden Valley, Minn.**

**Filed Jan. 12, 1981, Ser. No. 224,260**

**Int. Cl.³ F02P** *15/00;* **H03B** *29/00*

**U.S. Cl. 331—127** **7 Claims**



1. Electrical noise generating apparatus comprising:

(a) a source of direct current voltage;

(b) spark discharge means connected to be energized by said source of direct current voltage;

(c) semiconductor switching means disposed between said source and said spark discharge means for selectively interrupting current flow therethrough;

(d) control means including triggerable timing means coupled to said semiconductor switching means for selectively determining which of a plurality of events will operate said semiconductor switching means;

(e) manually operable, multi-position switch means having a pole thereof coupled to said triggerable timing means for determining which of said plurality of events will trigger said triggerable timing means; and

(f) a variable frequency oscillator coupled to one position of said multi-position switch means for causing said triggerable timing means to be repetitively triggered at a predetermined rate.

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**4,382,236**

**STRIP LINE CABLE USING A POROUS, CRYSTALLINE POLYMER DIELECTRIC TAPE**

**Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan**

**Filed Apr. 13, 1981, Ser. No. 253,734**

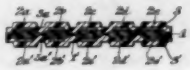
**Claims priority, application Japan, Dec. 5, 1980, 55-62608**

**Int. Cl.³ H01P** *3/08*

**U.S. Cl. 333—1** **7 Claims**

1. A strip line cable comprising a dielectric in tape form made of a porous, crystalline polymer having a low dielectric

constant approaching that of air and having at least one pair of electrical conductors, each said pair of conductors having one conductor located on one side of said tape and the other conductor located on the opposite side of said tape and in substantially parallel relationship to the first conductor of the pair, and having outer insulating layers made of a suitable non-porous plastic material placed over said conductors to affix them to said dielectric tape and encapsulate the cable assembly.



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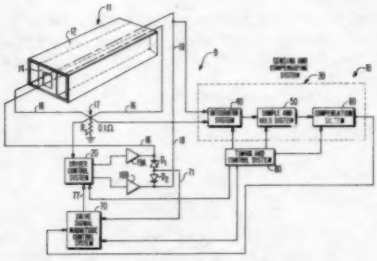
**4,382,237**

## TEMPERATURE COMPENSATION OF A FLUX DRIVE GYROMAGNETIC SYSTEM

**Henry F. Inacker, Cinnaminson, N.J., and Elmer L. Henderson, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Jun. 10, 1981, Ser. No. 272,396**
**Int. Cl.³ H01P 1/195**
**U.S. Cl. 333—24.1** **6 Claims**



1. A system for temperature compensation of a flux drive gyromagnetic system, said compensation system including:

means for switching the gyromagnetic structure of said gyromagnetic system from a saturated condition in one direction to a saturated condition in an opposing direction;

means for measuring the amount of flux change in said gyromagnetic structure during said switching;

means for determining from said measured flux change and a reference value the amount of compensation to be used; and

means for modifying the drive signal which is used to set the gyromagnetic structure to a desired non-saturated condition in accordance with the amount of compensation determined by said means for determining.

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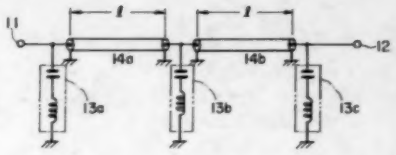
**4,382,238**

## BAND STOP FILTER AND CIRCUIT ARRANGEMENT FOR COMMON ANTENNA

**Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Filed Dec. 1, 1980, Ser. No. 211,897**
**Claims priority, application Japan, Nov. 30, 1979, 54-155985**
**Int. Cl.³ H01P 1/213; H03H 7/46, 7/01**
**U.S. Cl. 333—134** **18 Claims**




1. A band stop filter comprising:

(a) input and output terminals;

(b) a plurality of series resonating circuits, one of which is connected between said input terminal and ground, and another series resonating circuit being connected between said output terminal and ground; and

(c) a plurality of coaxial cables for connecting each one of said series resonating circuits to another, each of said coaxial cables having a length which is longer than quarter wavelength by an amount in the range of 5 to 20 percent thereof at the center frequency of the rejection band.

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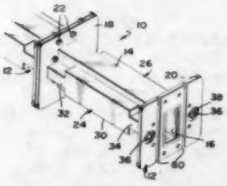
**4,382,239**

## WAVEGUIDE COOLING SYSTEM

**Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Bill C. J. Chen, and Robert W. Hartop, both of Pasadena, Calif.**

**Filed Apr. 30, 1981, Ser. No. 259,210**
**Int. Cl.³ H01P 1/30**
**U.S. Cl. 333—248** **7 Claims**



1. A microwave waveguide, comprising:

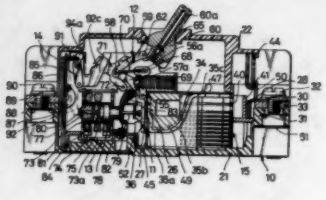
a waveguide section which includes a conduit pipe forming a microwave conduit and having a pair of pipe ends, a flange mounted at either end of the pipe, and walls forming a cooling duct extending along the length direction of said conduit and lying beside said conduit pipe;

at least one of said flanges having a through hole therein laterally spaced from said conduit and having one hole end coupled to said cooling duct.

## 4,382,240
## CIRCUIT BREAKER

Hideya Kondo; Youichi Yokoyama; Youichi Aoyama, and Tamotsu Mori, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 19, 1981, Ser. No. 265,332
Claims priority, application Japan, May 20, 1980, 55-67306
Int. Cl.³ H01H 73/12
U.S. Cl. 335—8 4 Claims



1. A circuit breaker comprising a housing, a handle extending out of said housing, and a plurality of breaker units housed respectively in each of compartments defined in the housing,

each of said breaker units comprising a manual contact opening and closing mechanism capable of being operated from the exterior through said handle and having a link operatively connected to the handle, said manual mechanism being made operative normally with a tripping link retained as locked to the mechanism and inoperative with said tripping member released from the mechanism, a movable contactor having a movable contact and capable of being rocked by the manual mechanism, a fixed contactor having a fixed contact with and from which said movable contact is engaged and separated, a resilient means for biasing said movable contactor normally away from said fixed contactor, an arc suppressing means disposed adjacent the fixed contactor for dividing, cooling and suppressing an arc generated upon openings of the contacts, and a tripping means responsive to an excess current for forcibly releasing the tripping link from the manual mechanism so as to cause the movable contactor rocked to be separated from the fixed contactor at least due to said biasing of said resilient means,

an interlinkage rod is further provided as passed through all the tripping links in all of the breaker units so that, upon released motion of one of the tripping links, all other tripping links will cooperate therewith through said rod, and

a test tripping member carried on said interlinkage rod for rotating said tripping links upon an application of external force.

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## 4,382,241
## VALVE ADJUSTMENT UNIT FOR HYDRAULIC PROPORTIONAL-RESPONSE VALVE

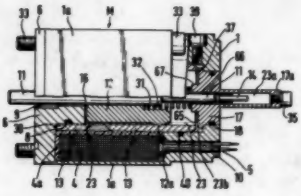
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 151,396
Claims priority, application Fed. Rep. of Germany, May 22, 1979, 2920670; Sep. 1, 1979, 2935468
Int. Cl.³ H01H 3/28
U.S. Cl. 335—153 18 Claims

1. A valve adjustment device adapted for attachment to an electronically controlled hydraulic proportional-response valve which has a valve body and a cooperating valve plunger defining a common longitudinal axis for said valve and the valve adjustment device, said device comprising in combination:

a proportional-response magnet unit of the solenoid-type having a magnet coil which surrounds an axially movable armature and a magnet unit housing which encloses the magnet coil and the armature, while forming a sealed displacement cavity for the armature, the magnet unit housing having a forward axial side on which it is sealingly attachable to said body of the proportional-response valve, for a coaxial drive connection between the magnet armature and the valve plunger and for hydraulic communication between the armature displacement cavity and a fluid-filled interior space of the proportional-response valve; and

an inductive displacement transducer arranged coaxially with the magnet unit, on its rearward axial side, the displacement transducer including a transducer coil which is fixedly mounted outside the magnet unit housing, in alignment with the unit axis, and a permanently magnetized transducer magnet which is movable in the central aperture of the transducer coil, being carried by a rod which extends axially rearwardly from the armature; and wherein



the magnet unit housing has a tubular rearward extension which reaches through the aperture of the transducer coil, while forming an enclosed magnet displacement cavity around the transducer magnet; and

the armature displacement cavity of the magnet unit communicates with the magnet displacement cavity of the displacement transducer via a gap around the magnet-carrying rod, with the result that the transducer magnet is, in effect, enclosed within the magnet unit housing and surrounded by the same hydraulic fluid which surrounds the armature.

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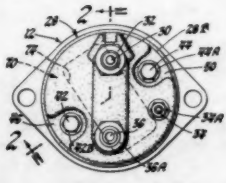
## 4,382,242
## SOLENOID OPERATED ELECTRICAL SWITCH

Jack A. Colvin; John V. Hellmann, and Alan L. Smock, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 332,473
Int. Cl.³ H01H 45/04
U.S. Cl. 335—202 3 Claims



1. A solenoid operated electrical switch comprising, a solenoid housing formed of metallic magnetic material having an end wall and a tubular portion extending axially of the end wall in one direction, a plurality of threaded mounting studs extending axially of said end wall located at the exterior of said solenoid housing, a generally cup-shaped insulator cover formed of electrical insulating material having openings receiving said studs and defining a chamber with the end wall of said solenoid housing, fastener means threaded to said studs each having

head means engaging an end portion of a stud and a flat portion of said insulator cover when the fastener means are tightened to a position wherein the head means engages an end portion of a stud, a thin gasket formed of spring metal material carrying an outer layer of elastomeric material on both sides thereof interposed between the end wall of the solenoid housing and said insulator cover and sandwiched between the same in a substantially circular configuration, the gasket having an initial flat configuration, the insulator cover having an outer circumferentially extending generally conical surface inclined toward the longitudinal axis of the cover engaging an outer annular marginal portion of the gasket, the solenoid housing engaging the gasket, the insulator cover, studs and fastener means being so arranged that said gasket is flexed from its initial flat configuration to a bowed configuration when said fastener means is tightened to engage said head means with an end portion of a stud, said bowed gasket providing an axial spring force to resiliently clamp said insulator cover between said marginal portion of the gasket and said fastener head means and sealing engagement between the gasket and solenoid housing and between the gasket and insulator cover, and switching means disposed within said chamber.

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**4,382,243**

## ELECTROMAGNETIC POSITIONING DEVICE WITH PIEZO-ELECTRIC CONTROL

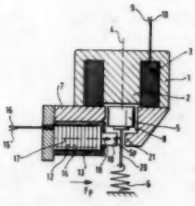
**Rudolf Babitzka, Kirchberg, and Walter Beck, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 17, 1981, Ser. No. 274,526**

**Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031354**

**Int. Cl.³ H01L *41/08*; H01F *7/08***

**U.S. Cl. 335—219** **8 Claims**



1. Apparatus for preventing movement of an armature in an electromagnetic system comprising a first means (6) for applying a force in a predetermined direction to said armature and electromagnetic means (1,2,3) for applying a force to said armature to a second direction opposite said predetermined direction, said apparatus comprising

a plurality of piezo electric discs (14) arranged in a column;

means (15,16) for applying electrical energy to said discs, the length of said column changing by a predetermined incremental length in response to a change in electrical energy applied thereto;

and a locking member (18) mounted on said column for movement therewith in the lengthwise direction thereof and mounted to engage said armature preventing movement thereof or be disengaged from said armature allowing movement thereof in dependence on the absence or presence of said electrical energy.

**4,382,244**

## DEVICE FOR MAGNETICALLY ORIENTING THE MAGNETIZABLE PARTICLES OR MAGNETIC RECORDING MEDIA IN A PREFERRED DIRECTION

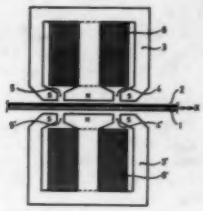
**Eberhard Koester, Frankenthal; Paul Deigner, Willstaett; Dieter Schaefer, Lindenberg; Karl Uhl, Frankenthal, and Roland Falk, Achern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Mar. 11, 1981, Ser. No. 242,560**

**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010873**

**Int. Cl.³ H01F *7/20***

**U.S. Cl. 335—284** **1 Claim**



1. A device for magnetically orienting the magnetizable particles of magnetic recording media other than metal discs in a preferred direction, which media are obtained by applying a coating of anisotropically magnetic particles finely dispersed in a solution of an organic binder system and conventional additives to a non-magnetic base, and subsequently solidifying the coating, by the action, on the still fluid coating, of the magnetic fields produced by two electromagnets which are arranged symmetrically with respect to, and in mirror-image relationship to, the plane of the said coating, and between the pole shoes of which air gaps are formed, wherein the two electromagnets are E-shaped and each have three pole shoes between which two coplanar air gaps are formed, the face of all three pole shoes of each said electromagnet extending in a plane parallel and in close proximity to the recording media, and the coils are wound on the middle legs of the E-shaped magnets.

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**4,382,245**

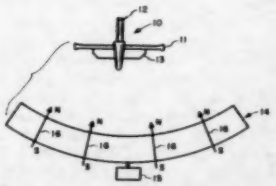
## LEVITATION DEVICE

**Roy M. Harrigan, Bromley Mountain Rd., Manchester, Vt. 05254**

**Continuation of Ser. No. 899,733, Apr. 25, 1978, abandoned, which is a continuation of Ser. No. 658,694, Feb. 17, 1976, abandoned. This application Dec. 19, 1979, Ser. No. 105,239**

**Int. Cl.³ H01F *7/02***

**U.S. Cl. 335—306** **13 Claims**



1. A levitation device for cooperation with associated means for producing rotational movement which comprises:

a first dish-shaped magnet having a concave surface uppermost having a first axis;

a second magnet assembly having at least one polar orientation which repels said concave surface;

means for stabilizing said second magnet over said first magnet in spaced elevational relationship with only mag-

netic fields supporting said second magnet said means for stabilizing comprising an element having a second axis, said element including said second magnet, said second magnet repelling said concave surface of said first magnet when said first axis and said second axis are coaxial and said second magnet is disposed above said first magnet; and

said element including means for cooperating with the associated means for producing rotational movement to cause said element to rotate about said second axis relative to said first dish-shaped magnet.

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**4,382,246**

**APPARATUS FOR MEASURING TEMPERATURE**

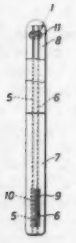
**Ingvar J. M. Hansson, Staffanstorp; Håkan B. Håkansson, Lund; Magnus G. K. Igefjord, and Berth-Ove G. Wall, both of Bjärred, all of Sweden, assignors to Crafon Medical AB, Sweden**

**PCT No. PCT/SE79/00018, § 371 Date Sep. 25, 1980, § 102(e) Date Jun. 1, 1979, PCT Pub. No. WO80/01608, PCT Pub. Date Aug. 7, 1980**

**PCT Filed Jan. 25, 1979, Ser. No. 196,079**

**Int. Cl.³ G01K *1/14*; H01C *1/14, 3/10***

**U.S. Cl. 338—26,13 HR** **15 Claims**




1. Apparatus for measuring temperature, comprising a first electrical insulating layer, having a first surface and a second surface opposite said first surface of said first insulating layer; a second electrical insulating layer, having a first surface and a second surface opposite said first surface of said second insulating layer, said second surface of said second insulating layer being attached to said surface of said first insulating layer; first and second electrical conductors disposed between said first and second insulating layers; sensing means located within at least one of said first and second insulating layers for sensing temperature, said sensing means being electrically connected to said first and second electrical conductors and having electrical properties which vary with temperature; a first opening formed in said first surface of said first insulating layer and extending through said first insulating layer to said second surface thereof so as to expose said first electrical conductor for the purpose of permitting electrical contact therewith from one side of said apparatus; and a second opening formed in said first surface of said second insulating layer and extending through said second insulating layer to said second surface thereof so as to expose said second electrical conductor for the purpose of permitting electrical contact therewith from the other side of said apparatus, said first opening being offset from said second opening such that said first electrical conductor is insulated by said second insulating layer to thereby inhibit electrical contact with said first electrical conductor from said other side of said apparatus and said second electrical conductor is insulated by said first insulating layer to thereby inhibit electrical contact with said second electrical conductor from said one side of said apparatus, whereby said first and second electrical conductors can be contacted electrically from opposite sides of said apparatus by a temperature reading unit adapted to receive from said first and second electrical conductors electrical signals representing a temperature sensed by said sensing means and then convert the signals into a readable temperature value.

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**4,382,247**

**PRESSURE SENSOR**

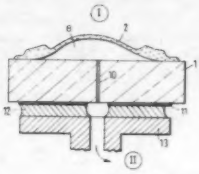
**Günther Stecher, Ludwigsburg; Kurt Spitzenberger, Weilder Stadt, and Klaus Müller, Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 27, 1980, Ser. No. 181,839**

**Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008572; Mar. 14, 1980, 3009811**

**Int. Cl.³ H01L *10/10***

**U.S. Cl. 338—42** **16 Claims**




1. Pressure transducer, particularly to determine the pressure conditions in the induction pipe of an internal combustion engine, having

a membrane (2) secured to a substrate (1) and defining a chamber (8) between the membrane and the substrate,

wherein, in accordance with the invention,

the substrate (1) comprises at least one of the materials selected from the group consisting of ceramic, glass, enameled metal;

said substrate defines a boundary zone (2') and a central zone (3') within said boundary zone;

and the membrane (2) comprises a solidified layer applied by thick-film technology which is bonded to the boundary zone (2') of the substrate and is bulged upwardly from the substrate in the central zone (3') within said boundary zone,

said membrane being a bowed dome structure prestressed in compression, and

comprising a material having a lower temperature coefficient of expansion than the temperature coefficient of expansion of the substrate.

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**4,382,248**

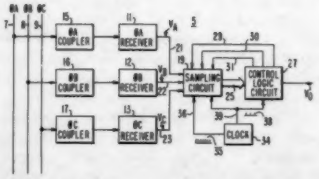
**REMOTE DEVICE FOR A MULTI-PHASE POWER DISTRIBUTION NETWORK COMMUNICATION SYSTEM**

**Stephen M. Pai, Six Forks, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 9, 1981, Ser. No. 252,689**

**Int. Cl.³ H04Q *3/00*; H04M *11/04*; H04L *27/00***

**U.S. Cl. 340—310 A** **5 Claims**




1. A remote device for receiving multiple communication

signals carried by the phase conductors of a multi-phase power distribution network communication system, comprising:

means for independently receiving each of said communication signals carried by said phase conductors, said means producing an input signal having a serial format in response to each of said received communication signals;

means for producing a train of clock pulses and a train of strobe pulses, each of said strobe pulses produced in response to the production of a predetermined number of said clock pulses;

a plurality of serial to parallel shift registers each producing a sample value of one of said input signals in response to each of said clock pulses, each of said shift registers having a latched output for receiving said sample values in response to each of said strobe pulses and for presenting said sample values in a parallel format; and

control logic means for reconstructing said communication signals in response to said parallel formatted sample values, said control logic means being responsive to said reconstructed communication signals.

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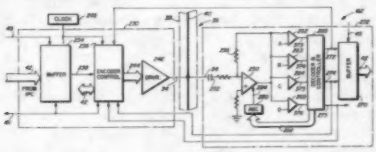
**4,382,249**

## APPARATUS AND METHOD FOR DECODING INFORMATION

**Herbert K. Jacobsthal, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Dec. 22, 1980, Ser. No. 219,148**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 DD** **4 Claims**



1. A decoder, for decoding a predetermined encoded binary information stream wherein said encoded binary information stream varies between a first, second, third, and fourth input signal level, comprising:

(a) differentiator means, having an input terminal adapted to receive said predetermined encoded binary information stream to provide a differentiated output signal;

(b) comparator means, coupled to said differentiator means, and having a plurality of output terminals, for comparing said differentiated output signal to a plurality of predetermined levels to provide an output signal on respective output terminals when the amplitude of said differentiated output signal exceeds said predetermined levels, wherein said comparator means includes;

a first, second, third, and fourth comparator each having a first and second input, the first input of each comparator operatively coupled to receive said differentiated output signal, and the second input of each comparator operatively coupled to a corresponding first, second, third, and fourth detection signal level, outputting said output signal on respective first, second, third, and fourth output terminals of said comparator when the amplitude of said differentiated output signal has exceeded the corresponding detection signal level; and

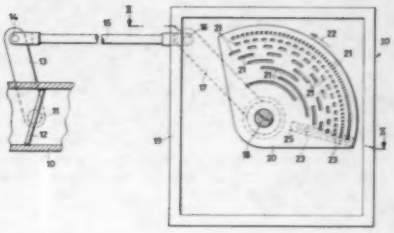
(c) logic means, coupled to said plurality of output terminals, for decoding the output signals of said comparator means to provide a decoded signal, said decoded signal being a decoded binary information stream having a first and second level.

**4,382,250**

## NONLINEAR DIGITAL TRANSDUCER BASED ON THE GRAY'S ENCODING

**Dario Radaelli, Legnano, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy**

**Filed May 19, 1981, Ser. No. 265,225**
**Claims priority, application Italy, Jun. 3, 1980, 22524 A/80**
**Int. Cl.³ H03K *13/18***
**U.S. Cl. 340—347 P** **5 Claims**



1. An analogic-digital transducer based on the Gray's encoding method for detecting the position of a movable member, comprising an encoding card mechanically connected to said movable member, the encoding card being equipped with a grid of opaque and transparent windows with sequences of elementary windows arranged perpendicularly to the direction of the displacement, said sequences being in a number equal to that of the encoded values corresponding to the different positions of the movable member, and with sequences of elementary windows arranged in the direction of the displacement, said sequences being in a number equalling that of the binary digits which compose the same encoded values, said transducer comprising a series of photodiodes and a series of phototransistors in a number equalling that of the elementary windows which compose the binary digits of each of the encoded values, said photodiodes and said phototransistors being fixed relative to the encoding card and being confrontingly positioned with the encoding card interposed therebetween and with a collimating member capable of concentrating the luminous radiation of the photodiodes onto the phototransistors, the transducer further comprising a circuitry of comparators operatively connected with said phototransistors and capable of squaring up the voltage signal delivered by each phototransistor for comparison with a preselected voltage threshold, said transducer being characterized by an encoding card wherein the gap between the encoded displacement values is variable as a function of the same values taken by the displacement in the field of variation thereof and the width of the elementary opaque and transparent windows, as measured in the direction of the displacement, is variable and is equal to the gap width.

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**4,382,251**

## ENVELOPE CONTROL DEVICE FOR PIEZOELECTRIC BUZZER

**Hidetaka Fujisawa, Fusea, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Sep. 23, 1980, Ser. No. 189,759**
**Int. Cl.³ G08B *3/00*; H01L *41/10***
**U.S. Cl. 340—384 E** **6 Claims**

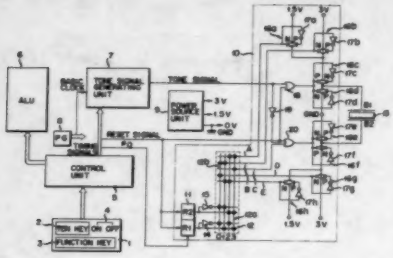
1. An envelope control device for a piezoelectric buzzer comprising:

a sound generator having two surfaces, and comprising an oscillating plate with a piezoelectric element attached thereto;

a power source for supplying voltages to be applied to both surfaces of said sound generator;

tone signal generating means for generating a tone signal for generating an electric tone; and

envelope control means for changing with time voltages to be applied to said both surfaces of said sound generator for



supplying said changing voltages to said sound generator for push-pull operation, thereby providing an envelope to a generated electric tone.

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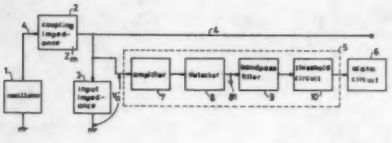
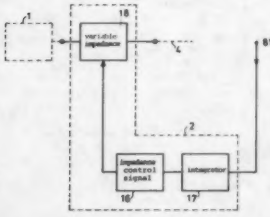
4,382,252

## INTRUSION WARNING SYSTEM

Hiroshi Ohashi, Hirakata, and Yuji Takada, Neyagawa, both of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Mar. 30, 1981, Ser. No. 248,903
Claims priority, application Japan, Mar. 31, 1980, 55-42324
Int. Cl.³ G08B *13/26*
U.S. Cl. 340—562 7 Claims





1. An intrusion warning system for detecting the presence of an intruder in a given area comprising:

an antenna provided around the given area, said antenna being insulated from ground;

an oscillator for feeding an alternating current signal to said antenna;

a coupling impedance means connected between an output of said oscillator and said antenna, said coupling impedance means including a means for varying impedance to obtain optimum detection sensitivity;

a signal processing means for detecting the alternating current signal on said antenna and producing an output signal in response to a change in the alternating current signal on said antenna exceeding a predetermined level;

said means for varying impedance comprising a feedback loop from said signal processing means to said coupling impedance, said feedback loop including an integrator circuit for integrating the alternating current signal on said antenna and an impedance control means for controlling the impedance value of said coupling impedance in accordance with integrated value, so that changing of the coupling impedance is carried out only for slow changes in the detected alternating current on said antenna and not for rapid changes due to the presence of an intruder in the given area.

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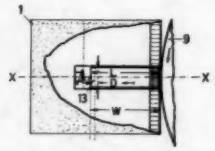
4,382,253

## METHOD FOR MEASURING ABRASION IN A GRINDING OPERATION AND APPARATUS THEREFOR

Heinz Belthle, Aichwald, Fed. Rep. of Germany, assignor to FORTUNA-WERKE Maschinenfabrik GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,177
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908114
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—680 5 Claims



1. In a grinding operation a method of measuring the abrasion depth of at least one outer surface of a substantially stationary body such as a tool which rests in working position against a rotating body for example a rotating workpiece such as a shaft to be ground, comprising the steps of

moving a measurement pin in a first direction D in a measurement sleeve, which sleeve is arranged in the stationary body, by the shaft into a starting position by pressing on one end of the measurement pin, said measurement pin defines a length L, W in said starting position, such that another end of the measurement pin is spaced apart from an electric contact disposed inside the sleeve,

during the grinding operation, as a result of the abrasion on said surface of the stationary body, on said one end of said measurement pin and on said sleeve, by the shaft pressing on said surface, on said one end of the measurement pin and on said sleeve, continuously further moving the measurement pin in the first direction in the sleeve such that upon traversing a distance (cf. W1), the latter distance being predetermined such that it is traversed when the surface of the stationary body has been completely abraded to a predetermined amount so as to be required to be replaced, said another end of the measurement pin contacts against the electric contact so as to provide an alarm via an electric circuit of an indicating device, and

measuring the abrasion on said one end of said measurement pin, comprising the steps of

storing in a path detection system a desired reference length B of an end length (cf. 13) of the measurement pin,

before a start of a new grinding operation removing the shaft from contacting the stationary body and said measurement pin and moving the measurement pin back in a second direction opposite to said first direction so that said end length moves past stationary measurement feelers which are arranged laterally on the measurement sleeve and are operatively connected with the path detection system, and measuring and comparing the end length (13) of the measurement pin, which end length has moved past the measurement feelers in said second direction, with the desired reference length B stored in the path detection system, and

initiating an alarm signal if the measured end length (13) of

the measurement pin is at most the same as the stored desired reference length B.

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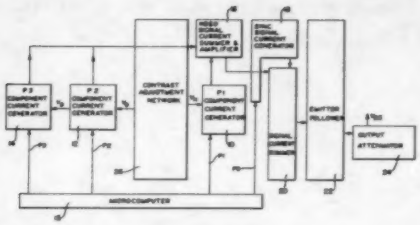
**4,382,254**

## VIDEO DISPLAY CONTROL CIRCUITRY

**Charles Ranalli, Burlington, Mass., assignor to Nixdorf Computer Corporation, Burlington, Mass.**

**Filed Jun. 18, 1980, Ser. No. 160,696**
**Int. Cl.³ G09G 1/14**
**U.S. Cl. 340—744** **9 Claims**



1. Multilevel video display circuitry comprising:
first circuit means (10) for developing a first current in response to a first command signal (P1);
second circuit means (12) for developing a second current in response to a second command signal (P2);
third circuit means (14) for developing a third current in response to a third command signal (P3);
summing means (28) coupled to the outputs of said first, second, and third circuits for summing the currents developed thereby;
output means (22) for providing selected voltage levels to control the brightness of dots on the video display as a function of the output of the summing means; and
contrast adjustment network means (26) including first means (K1) for setting the magnitude of the first current at a desired dim but visible level by varying the first current and simultaneously inversely varying said second and third currents, and second means (K2) for varying the magnitude of said second and third currents while maintaining said first current at said desired level.

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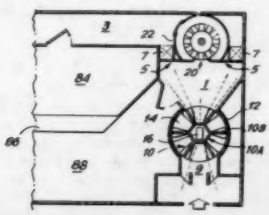
**4,382,255**

## SECURED AUTOMATED BANKING FACILITIES

**Gisberto Pretini, Via Macerata 3, S. Frediano a Settimo, Pisa, Italy**

**Filed Oct. 13, 1981, Ser. No. 311,154**
**Claims priority, application Italy, Oct. 24, 1980, 9568 A/80; Jan. 20, 1981, 9321 A/81**
**Int. Cl.³ H04Q 3/00; E05G 5/02**
**U.S. Cl. 340—825.31** **7 Claims**



1. In an automated banking system, means defining a room accessible to the public, at least one surveillance means monitoring an area of said room, said area including equipment defining an automated bank counter and an assembly of strongboxes, means defining an access position for said strongbox assembly, and movable apparatus carrying said strongbox assembly, said movable apparatus being controlled so that a selected strongbox can be presented to said access position.

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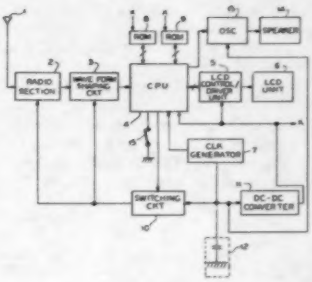
**4,382,256**

## PAGING RECEIVER WITH DISPLAY

**Koichi Nagata, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Oct. 29, 1980, Ser. No. 201,990**
**Claims priority, application Japan, Nov. 1, 1979, 54-140442**
**Int. Cl.³ G08B 5/22; H04Q 1/30**
**U.S. Cl. 340—825.44** **10 Claims**



1. A paging receiver comprising: first means for receiving and demodulating a carrier wave modulated with at least a paging signal code assigned to the receiver, and a plurality of information key codes corresponding to a plurality of words, respectively; second means responsive to a detection of said paging signal code for decoding said information key codes; third mean for storing in advance a plurality of words individually corresponding to said information key codes, respectively; fourth means for reading out of said third means those words which correspond to the decoded information key codes; and fifth means for displaying the read-out words in a sentence form.

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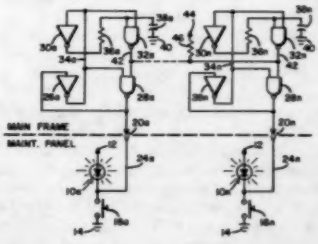
**4,382,257**

## N INDICATOR-SWITCHES CONNECTED FOR ONE OF N SELECTION BY N WIRES

**Joseph M. Cortner, Cottage Grove, Minn., assignor to Sperry Corporation, New York, N.Y.**

**Filed Jul. 27, 1981, Ser. No. 286,735**
**Int. Cl.³ H04Q 1/00; G08B 5/00; H03K 3/284**
**U.S. Cl. 340—825.87** **7 Claims**



4. An electrical circuit apparatus for bidirectionally receiving and providing on a plurality of signal lines a plurality of parallel signals only one of which is presented at a time, which apparatus comprises:

a plurality of cross-coupled flip-flop storage action latching means associated with said plurality of signal lines for gating set by an associated received on of said plurality of parallel signals for the duration of said received signal as input on one of said plurality of signal lines,

storing said associated received one of said plurality of parallel signals as input on one of said plurality of signal lines, and

outputting on said associated received one of said plurality of signal lines the stored signal;

a plurality of one-shot circuit means associated with said plurality of signal lines and merged with said plurality of latching means for providing, in response to an associated received one of said plurality of parallel signals received as input on one of said plurality of signal lines, a pulsed control signal shorter in duration than the time of said received one of said plurality of parallel signals; and

interconnection wire means for distributing each said pulsed control signals on a clear signal input to all said plurality of latching means;

whereby the clearing of all said latching means shorter in duration than the gating set of the one said latching means associated with said received one of said plurality of input signals will result in storing and outputting on only the one of said plurality of latching means which was associated with the one of said plurality of parallel signals.

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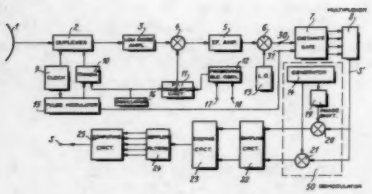
**4,382,258**

## AIRBORNE FREQUENCY-MODULATION RADAR AND ITS APPLICATION TO A MISSILE HOMING HEAD

**Remy Tabourier, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Oct. 23, 1980, Ser. No. 199,994**
**Claims priority, application France, Oct. 26, 1979, 79 26612**
**Int. Cl.³ G01S *13/26***
**U.S. Cl. 343—17.2 R** **11 Claims**



1. An airborne frequency-modulation radar comprising a transmission-reception antenna and a duplexer connected on the one hand with transmission means for delivering a wave which is frequency-modulated by first modulating means and pulse-modulated by second modulating means and on the other hand with reception means including demodulating means, means for sampling, coding and filtering demodulated signals, wherein the form factor of the modulation pulses generated by the second modulating means being much lower than $\frac{1}{4}$, the reception means further comprises:

means for adding the frequency of the output frequency-modulated signal of the first modulating means and the frequency $F=f_i+m\tau+fm$ of the signal delivered by a voltage-controlled oscillator, wherein m is the slope of the frequency-modulation carried out by the first modulating means, fi a constant predetermined intermediate frequency, $\tau$ a time-delay (2d/Vc) representing the selected search distance d, Vc being the velocity of the light in the medium considered, $f_m$ is equal to $2f_0(V_m\cos\theta+V_k)/Vc$, $V_m$ being the velocity of the missile, $V_k$ the radial velocity of the target, $f_0$ the nominal frequency transmitted and $\theta$ the angle between the velocity $V_m$ of the missile and the direction of the target; and

means for mixing the echo signal reflected from the target and the signal delivered by the adding means.

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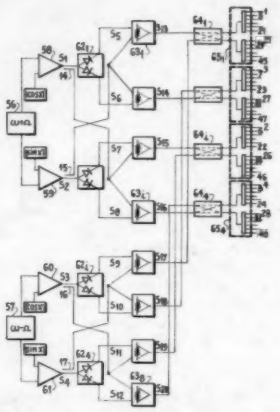
**4,382,259**

## DEVICE FOR SUPPLYING A RADIONAVIGATION SYSTEM OF THE DOPPLER VOR TYPE AND A DOPPLER VOR SYSTEM COMPRISING SAID DEVICE

**Henri Becavin, Bretigny, and Alain Grousseau, Conflans St. Honorine, both of France, assignors to Thomson-CSF, Paris, France**

**Filed Mar. 4, 1981, Ser. No. 240,283**
**Claims priority, application France, Mar. 5, 1980, 80 04950**
**Int. Cl.³ G01S *1/44***
**U.S. Cl. 343—106 D** **10 Claims**



1. A device for supplying a radionavigation system of the Doppler VOR type for radiating in particular the two sidebands of an amplitude modulation of a VHF carrier wave, comprising means for generating the sidebands, and said means in the case of each sideband comprising a generator and two modulator-amplifiers for amplitude-modulating the signal derived from the generator by means of a periodic voltage F(t), a device for switching the $N_o$ antennas of the circular array which radiates said sidebands, in said Doppler VOR said device comprising means for coupling and means for adding the amplitude-modulated sidebands so as to produce a signal having a predetermined spectrum for supplying said antennas and to compensate for the coupling existing between said antennas.

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**4,382,260**

## TWO CHANNEL TRANSMIT ONLY ANTENNA

**Joseph C. Ranghelli, Brooklyn, N.Y., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed May 11, 1981, Ser. No. 262,562**
**Int. Cl.³ H01Q *5/01***
**U.S. Cl. 343—730** **22 Claims**

1. A two channel transmit only antenna comprising:

a balanced antenna having two radiators;

a ground plane disposed between said two radiators;

at least one resistor connected between said two radiators;

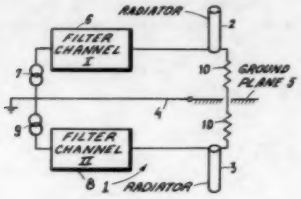
a three wire type feed system for said two radiators having one conductor connected to ground and said ground plane and two conductors each connected to a different one of said two radiators;

a first two terminal source of a first transmit signal disposed in a first frequency channel having one terminal thereof connected to said one conductor;

a second two terminal source of a second transmit signal disposed in a second frequency channel independent of said

first channel having one terminal thereof connected to said one conductor;

a first channel filter coupled between the other terminal of said first source and one of said two conductors; and




a second channel filter coupled between the other terminal of said second source and the other of said two conductors.

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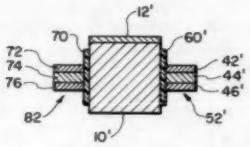
**4,382,261**

## PHASE SHIFTER AND LINE SCANNER FOR PHASED ARRAY APPLICATIONS

**Elmer Freibergs, Toms River; Robert E. Horn, Middletown, and Harold Jacobs, West Long Branch, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 5, 1980, Ser. No. 146,560**
**Int. Cl.³ H01Q 3/26**
**U.S. Cl. 343—854** **5 Claims**




1. A semiconductor waveguide scanning antenna, comprising in combination:

a length of semiconductor waveguide of rectangular cross section adapted to propagate wave energy along a longitudinal axis transverse to said cross section and having a plurality of spaced parallel metallic elements selectively located on one surface of said waveguide along its length which act as perturbations that interact with the propagated wave energy to produce at least a first radiation pattern directed outwardly from said one surface at a predetermined radiation angle;

distributed PIN diode means formed from contiguous layers of semiconductive material located on an adjacent surface of said waveguide which is perpendicular to said one surface, said layers being disposed orthogonally with respect to and projecting outwardly from said adjacent surface, so that the PIN diode means lies entirely outside of the rectangular cross section of the semiconductor waveguide, a dielectric insulator layer disposed between said PIN diode means and said adjacent surface; and

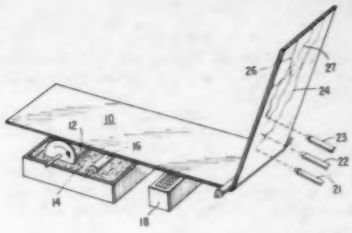
means coupled to said PIN diode means for applying a bias potential thereto for controlling the conductivity of said PIN diode means which has the effect of varying the wavelength of said semiconductor waveguide and accordingly the radiation angle of said first radiation pattern.

**4,382,262**

## MULTICOLOR JET PRINTING

**Joseph Savit, 751 Vernon Ave., Glencoe, Ill. 60022**

**Filed Mar. 23, 1981, Ser. No. 246,201**
**Int. Cl.³ G01D 15/16**
**U.S. Cl. 346—1.1** **13 Claims**




1. A method of printing a multicolor image on a non-absorbent, transparent substrate comprising providing a first jet printing nozzle at a fixed distance from said substrate, providing relative transverse movement between said first jet printing nozzle and said substrate while ejecting from said first jet printing nozzle and toward said substrate a first stream of individual image forming liquid droplets comprising a first image forming resin-free composition, providing at least a second printing nozzle at a fixed distance from said substrate, providing relative transverse movement between said second jet printing nozzle and said substrate while ejecting from said second jet printing nozzle and toward said substrate a second stream of individual image forming liquid droplets comprising a second image forming resin-free composition, each of said first and second image forming compositions containing a different substantially colorless material capable of being converted to a colored material by reaction with a chemical agent, and said substrate having a surface transparent coating comprising a resinous binder containing a chemical agent capable of converting said first image forming composition to a material of one color and said second image forming composition to a material of another color.

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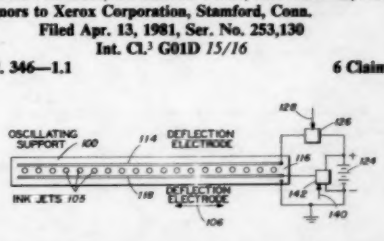
**4,382,263**

## METHOD FOR INK JET PRINTING WHERE THE PRINT RATE IS INCREASED BY SIMULTANEOUS MULTILINE PRINTING

**Kenneth H. Fischbeck, and Edward Forest, both of Dallas, Tex., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 13, 1981, Ser. No. 253,130**
**Int. Cl.³ G01D 15/16**
**U.S. Cl. 346—1.1** **6 Claims**




1. A method for ink jet printing comprising:

(a) providing a support member having an axis and a plurality of drop-on-demand ink jets aligned parallel to said axis mounted on said support member for printing a first line on a record-receiving member;

(b) providing means for oscillating said support member in a printing direction parallel to said axis;

(c) providing means for electrostatically deflecting preselected single droplets ejected from said ink jets in a direction away from said axis, said preselected single droplets

forming a second line of printing parallel to said first line; and

(d) oscillating said support member while droplets are ejected from said ink jets and electrostatically deflecting at least a portion of said droplets in a direction away from said axis to form at least two lines of printing on a record-receiving member.

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**4,382,264**

**MAGNETIC IMAGING TRANSFER PROCESS**

**Stephen I. Gaudioso, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 24, 1980, Ser. No. 200,232**
**Int. Cl.³ G01D *15/12***
**U.S. Cl. 346—74.4** **8 Claims**

1. A magnetic imaging method comprising the steps of:

(a) creating a latent magnetic image on a magnetizable imaging member comprising a base containing a magnetizable component;

(b) developing said latent magnetic image with toner having magnetic or magnetizable properties; and

(c) transferring the developed image by pressure contact from said magnetizable imaging member to a receiving substrate wherein said receiving substrate has been treated with a binder selected from the group consisting of a styrene-butadiene latex, polyvinyl alcohol, starch, clay, acrylic latex, polyvinyl acetate, carboxymethyl cellulose, polyvinyl pyrrodidone, soy proteins, casein, and mixtures thereof, and a plasticizer, selected from the group consisting of ethylene glycol dibenzoate, diphenylphthalate, dimethyl isophthalate, glycerol tribenzoate, dicyclohexyl phthalate, diphenyl isophthalate, and mixtures thereof.

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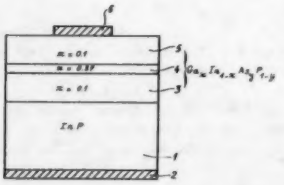
**4,382,265**

**HETEROJUNCTION SEMICONDUCTOR DEVICE**

**Thomas Pearsall, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Jan. 24, 1980, Ser. No. 115,097**
**Claims priority, application France, Jan. 26, 1979, 79 02098**
**Int. Cl.³ H01S *3/096;* H01L *29/203, 29/205, 33/00***
**U.S. Cl. 357—16** **1 Claim**



1. A heterojunction semiconductor device, capable of operating as an electroluminescent diode, comprising:

a substrate made of indium phosphide;

a first layer deposited on said substrate, said layer having a composition responding to the formula:

$$Ga_{x3}In_{1-x3}As_{y3}P_{1-y3}$$

a second layer deposited on said first layer, said second layer having a composition responding to the formula:

$$Ga_{x4}In_{1-x4}As_{y4}P_{1-y4}$$

and

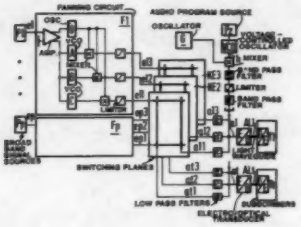
a third layer deposited on said second layer and of the same composition as said first layer wherein the width of the second layer is less than the width of the first or third layer and $x_3=0.1$; $y_3=0.22$; $x_4=0.27$ and $y_4=0.59$.

**4,382,266**

**BROAD BAND SWITCHING SYSTEM**

**Klaus Panzer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 5, 1980, Ser. No. 204,209**
**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951512**
**Int. Cl.³ H04N *7/18;* H04B *9/00***
**U.S. Cl. 358—86** **10 Claims**



1. A broad band switching system for the selective connection of broad band signals to a plurality of subscribers, comprising:

a plurality of broad band signal sources, each operable to produce respective angle-modulated signals;

a plurality of fanning circuits, each connected to a respective source and including a plurality of outputs and operable to provide the modulated signals at respective outputs on respective frequency channels;

a broad band switching network including a plurality of switching planes each assigned a frequency position and each including inputs connected to those outputs of said fanning circuits assigned to the same frequency position, and a plurality of outputs each assigned to a respective subscriber; and

a plurality of light transmission circuits each connected to all of the outputs of said switching network assigned to a respective subscriber.

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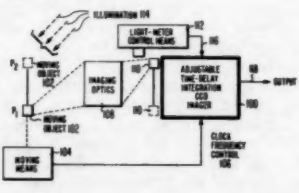
**4,382,267**

**DIGITAL CONTROL OF NUMBER OF EFFECTIVE ROWS OF TWO-DIMENSIONAL CHARGE-TRANSFER IMAGER ARRAY**

**Rodney L. Angle, Millstone, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Sep. 24, 1981, Ser. No. 305,172**
**Int. Cl.³ H04N *3/15;* H01L *31/00***
**U.S. Cl. 358—213** **9 Claims**



1. In combination:

a charge-transfer imager comprised of a two-dimensional array of picture-sampling stages arranged in N rows and Q columns, where N and Q are plural integers, and

digital-control means coupled to said imager, said digital-control means being responsive to the value of an applied digital signal for selectively disabling charge-transfer by at least the

picture sampling stages of the j'th row of said imager, where j may have any value, selected in accordance with said applied digital signal, between one and N.

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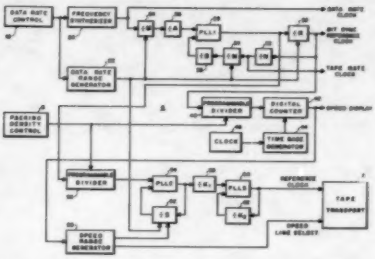
**4,382,268**

## TAPE TRANSPORT SPEED CONTROL

**Stanley H. Frimet, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Oct. 20, 1980, Ser. No. 198,936**
**Int. Cl.³ G11B *15/46***
**U.S. Cl. 360—73** **5 Claims**



1. A recording tape speed control system comprising
tape transport means for driving a recording tape in response to a tape speed selection signal representative of a selected tape speed and a reference frequency signal representative of a comparison standard at the selected tape speed,
means for supplying a signal representative of a desired packing density of data recorded on said tape,
means for supplying a signal representative of the rate of the data being received for recording on said tape,
means for deriving said tape speed selection signal and said reference frequency signal for said tape transport means in response to the ratio of the desired packing density of data recorded on said tape to the rate of the data being received for recording.

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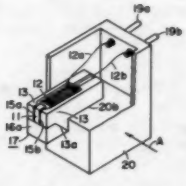
**4,382,269**

## MAGNETIC HEAD

**Minoru Kato, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan**

**Filed Jan. 15, 1981, Ser. No. 225,343**
**Claims priority, application Japan, Jan. 29, 1980, 55-9239[U]**
**Int. Cl.³ G11B *5/27, 5/20, 5/22***
**U.S. Cl. 360—121** **18 Claims**



1. A magnetic head comprising:
a first magnetic core made of material having high magnetic permeability and providing a first sliding surface for a tape;
a coil wound on said first magnetic core; and
at least one second magnetic core mounted adjacent said first core and made of material having high magnetic permeability, said second core being formed with a protrusion providing a second sliding surface for a tape, which defines a common sliding tape surface with said first sliding surface provided by said first core, and a stepped recess extending from said protrusion to a terminal region, one end of said coil wound on said first core being intermediate said sliding surfaces and said terminal region.

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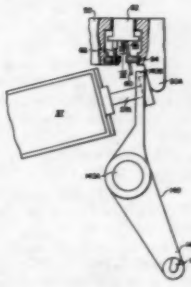
**4,382,270**

## GROUND FAULT CIRCUIT BREAKER WITH MECHANICAL INDICATOR FOR GROUND FAULT TRIPS

**Ronnie D. Davidson, Bridgeport, and Bruce S. Preston, Stratford, both of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 7, 1981, Ser. No. 251,792**
**Int. Cl.³ H02H *3/347*; H01H *83/02***
**U.S. Cl. 361—115** **2 Claims**



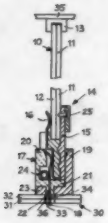
1. A ground fault circuit breaker, with a trip indicator for ground fault trips that is not actuated by overload trips, comprising:
a differential current transformer including a magnetic core, a plurality of primary windings on said core, each being arranged for connection with respective ones of the conductors of an AC electrical distribution system between a supply and a load, and a secondary sensing winding on said core for sensing current imbalance between said primary windings;
breaker contacts, operated by a trip mechanism, in series with at least one of said system conductors;
first means for actuating said trip mechanism upon occurrence of a predetermined sensed signal on said sensing winding comprising a solenoid having a plunger;
second means for actuating said trip mechanism upon occurrence of an overload through said at least one of the system conductors;
ground fault trip indication means for indicating a trip due to operation of said first means for actuating said trip mechanism and not to operation of said second means for actuating said trip mechanism comprising a button that is spring loaded and recessed within the breaker housing and is normally held in a latched position by latching means, said plunger of said first means for actuating said trip mechanism being arranged to result in releasing said latching means upon movement of said plunger as a result of a ground fault condition.

4,382,271

## ELECTRICAL AND THERMAL INTERCONNECTION SYSTEM FOR ELECTRONIC CIRCUIT BOARDS AND AN ELECTRICAL CABINET FITTED WITH SUCH A SYSTEM

Claude M. Villemont; Herve G. P. M. Bricaud, and Pierre Hamaide, all of Paris, France, assignors to Socapex, Suresnes, France

Filed Mar. 6, 1981, Ser. No. 241,429
Claims priority, application France, Mar. 7, 1980, 80 05198
Int. Cl.[3] H05K 7/20
U.S. Cl. 361—386 8 Claims



1. An electrical and thermal interconnection system for electronic circuit boards arranged in a cabinet, comprising at least one mother board constituted by an insulating support with printed conductors and two external metallic layers isolated from these conductors, and which is carried by slides attached to the side walls of the cabinet, rectangular daughter boards comprising a thermal collector, including in addition: zero insertion force electrical and thermal connectors each comprising electrical connection conductors and thermal conduction means, these conduction means being constituted by a metallic base and a metallic longitudinal wall, these connectors being applied by their bases to an external metallic layer of at least one mother board, other electrical and thermal connectors of this type being mounted by their metallic bases onto the other external layer of this mother board, and wherein the daughter boards comprising a thermal collector are each engaged by at least one longitudinal edge in an electrical and thermal connector such that the thermal collector of a daughter board is applied against the surface of the longitudinal metallic wall of a single electrical and thermal connector, the connection conductors of these connectors being connected electrically to the printed conductors on the daughter boards and mother board.

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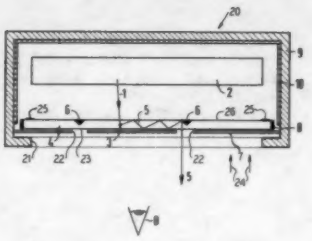
4,382,272

## COLORED LAMP

Ferdinand Quella, Gauting, and Heinz Pape, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 28, 1980, Ser. No. 201,555
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946191
Int. Cl.[3] F21V 9/16
U.S. Cl. 362—84 18 Claims

1. A colored lamp for emitting colored light of a given range of wavelengths, said lamp comprising a housing having an opening, a source of light being disposed in said housing and providi..g light of a given light wavelength spectrum, and means for absorbing the light of said light wavelength spectrum which has a shorter wavelength than a given range and emitting light with a longer wavelength in the given range, said means being disposed across said opening and including at least one luminescent body of transparent material containing fluorescent particles for absorbing light of the light wavelength spectrum and emitting fluorescent light of said longer wavelength, said particles being disposed in said body, said body being a light concentrator having at least one output location for output coupling light being conducted therein so that said body collects incident light by absorbing it at said particles and by total reflection of the emitted fluorescent light



at the boundary surfaces of the body until the emitted fluorescent light is output coupled at said output locations.

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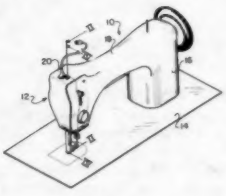
4,382,273

## SEWING MACHINE LIGHT FIXTURE

Orval Jones, 2609 Cowley Way, San Diego, Calif. 92110

Filed May 18, 1981, Ser. No. 264,287
Int. Cl.[3] D05B 79/00
U.S. Cl. 362—90 3 Claims



1. A sewing machine light assembly for attachment to the head of a machine of the type having a planar vertical end face defined by a removable face plate covering an opening in the end of the head, said light assembly comprising:

a housing having walls defining a generally half-shell configuration with an open side adapted to be mounted on a flat surface on the head of a sewing machine in a vertical position,

said housing defining a cavity having an upper closed end defined by an upper wall corresponding to the top of the housing and an enlarged portion intermediate the ends thereof for accommodating a flood light bulb,

a lower open end corresponding to the bottom of the housing,

a light socket mounted directly to said upper wall and opening downward for receiving a light bulb mounted at the upper end of said cavity and directing light downward toward said lower open end, and

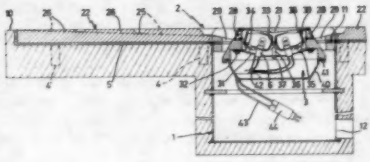
an opening at the lower end of said cavity extending the full width of the housing at the lower end thereof for directing light from the cavity onto a needle and foot of a sewing machine.

## 4,382,274

### FLUSH RUNWAY INSET TOP ASSEMBLY FOR AIRPORT GUIDANCE LIGHT APPARATUS AND GUIDANCE LIGHT APPARATUS COMPRISING A TOP ASSEMBLY OF THIS TYPE

**Jean A. De Backer, Brussels, and Jacques L. Yperman, Kraainem, both of Belgium, assignors to Societe Anonyme des Etablissements Adrien De Backer, Belgium**

**Filed Dec. 15, 1981, Ser. No. 330,814**
**Int. Cl.³ F21S 1/02**
**U.S. Cl. 362—153** **9 Claims**



1. A runway inset top assembly for use with a cylindrical airport light base so as to be set flush with the pavement, comprising:

a cover assembly having a circular shape with a flat top surface and having apertures for securement on top of the light base,

said cover assembly having at least one window fitted with optical prism or lens means for the passage of each output light beam from an optical system, said cover assembly further having a draining aperture in front of each said window; and

at least one light channel plate to be mounted adjacent the cover assembly in coaxial alignment with the optical axis of the apparatus, said channel plate having an elongated shape with circular arcuate end sides, the curvature of a first of said end sides mating with the curvature of the peripheral edge of the cover assembly so as to be placed adjacent said peripheral edge, said channel plate being formed with a longitudinal channel to be in coaxial alignment with said at least one window in the cover assembly for guiding the output light beam passing through said window, with the longitudinal edges and the outer end side of said plate being flush with the flat top surface of the cover assembly, and said channel plate further having apertures for securement in the runway.

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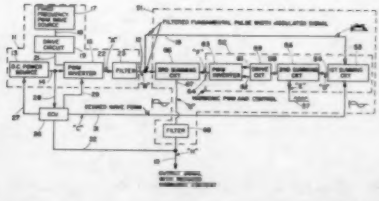
## 4,382,275

### PWM INVERTER CIRCUIT

**Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.**

**Filed Dec. 7, 1981, Ser. No. 327,872**
**Int. Cl.³ H02M 1/12**
**U.S. Cl. 363—41** **19 Claims**



1. A PWM inverter circuit having an output signal with reduced harmonic content, said circuit including:

first means to provide a filtered fundamental PWM signal,

second means electrically coupled to said first means to receive said signal and sum therewith a controlled signal that is the function of the sum of a desired waveform signal and said filtered fundamental PWM signal, said second means providing said output signal with reduced harmonic content.

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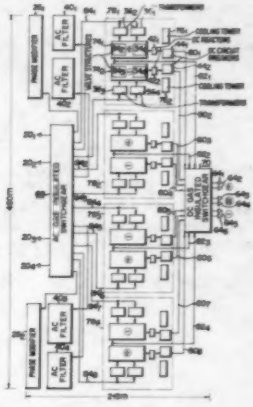
## 4,382,276

### AC-DC ELECTRIC POWER CONVERTING STATION

**Shinichi Menju, Atsugi, and Isao Kamata, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jul. 13, 1981, Ser. No. 282,586**
**Claims priority, application Japan, Jul. 16, 1980, 55-97228**
**Int. Cl.³ H02M 7/155**
**U.S. Cl. 363—141** **5 Claims**



1. An AC-DC electric power converting station comprising:

a gas-insulated AC side switchgear having first and second longitudinal sides opposite each other, and first and second transverse sides opposite each other;

a gas-insulated DC side switchgear having third and fourth longitudinal sides opposite each other, and third and fourth transverse sides opposite each other, and arranged opposite to said gas-insulated AC side switchgear with the third longitudinal side facing the second longitudinal side of said AC side switchgear;

at least one first group of semiconductor switching elements, each group enclosed within a first valve structure of positive polarity, said first valve structure having fifth and sixth longitudinal sides opposite each other, and fifth and sixth transverse sides opposite each other, and arranged between said AC and DC side switchgears with the fifth transverse side parallel to the second longitudinal side of said AC side switchgear, and the sixth transverse side parallel to the third longitudinal side of said DC side switchgear;

at least one second group of semiconductor switching elements connected to said first group of semiconductor switching elements, each group enclosed within a second valve structure of negative polarity, said second valve structure having seventh and eighth longitudinal sides opposite each other, and seventh and eighth transverse sides opposite each other, and so arranged that the seventh transverse side is parallel to the second longitudinal side of said AC side switchgear, the eighth transverse side is parallel to the third longitudinal side of said DC side switchgear, and said seventh longitudinal side faces the sixth longitudinal side of said first valve structure;

first and second converter transformers respectively connected to said first and second groups of semiconductor switching elements, and respectively arranged in opposi-

tion to the fifth and eighth longitudinal sides of said first and second valve structures;

first and second DC circuit breakers respectively connected to said first and second groups of semiconductor switching elements, and respectively arranged in opposition to the sixth and eighth transverse sides of said first and second valve structures, and between said DC side switchgear and said pair of first and second valve structures;

first and second DC reactors respectively connected between said first group of semiconductor switching elements and said first DC circuit breaker and between said second group of semiconductor switching elements and said second circuit breaker, said first DC reactor arranged between said first valve structure and first DC circuit breaker, and said second DC reactor arranged between said second valve structure and said second circuit breaker;

first conduit cables extending to connect said first and second valve structures to said AC side switchgear;

second conduit cables extending to connect said first and second valve structures to said DC side switchgear.

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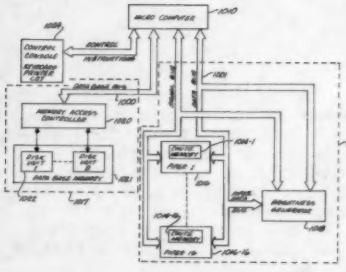
**4,382,277**

## METHOD AND MEANS UTILIZING MULTIPLE PROCESSING MEANS FOR DETERMINING DEGREE OF MATCH BETWEEN TWO DATA ARRAYS

**Edward L. Glaser, Santa Monica, and Louis M. Galie, Culver City, both of Calif., assignors to System Development Corp., Santa Monica, Calif.**

**Filed May 14, 1979, Ser. No. 38,517**
**Int. Cl.³ G06F 7/20, 15/16**
**U.S. Cl. 364—200** **33 Claims**



1. A method utilizing a plurality of processing means, each processing means comprising a plurality of data stores and a corresponding temporary store for each such data store, the method determining a particular criterion value and an associated positional value indicative of the degree of match between the juxtaposition of a plurality of event types of a query and a plurality of corresponding event types of a particular stored data base entry, the method utilizing a priorly-formed array of data values, each of the data values representing the number of event positions between the occurrence of an event type in the query and the occurrence of a corresponding event type in the particular stored data base entry, a group of one or more of the data values being provided for each of a plurality of different ones of the query event types, each different group being stored in a different data store with the data values thereof arranged in an incremental order from one end thereof to the other, one end being called a first end, the method comprising the steps of:

(a) designating in each processing means at least one of the data values contained in each of a plurality of the data stores as a first data value;

(b) detecting in each processing means at least one of the designated first data values, from step (a), where the detected data value has a predetermined magnitude relative to the other designated first data values in such processing means;

(c) determining from among the detected data values for all of the processing means a particular detected data value which has a predetermined magnitude relative to the others and providing a determined value corresponding to the particular detected data value;

(d) storing in each processing means the at least one detected data value, from step (b), in the temporary store which corresponds to the data store in which such detected data value is detected;

(e) forming in each of the processing means for each of the individual data stores thereof a first distance value which represents the algebraic difference between the determined data value, from step (c), and the designated data value, from step (a), in such data store;

(f) forming in each processing means for each of the individual data stores thereof a second distance value representing the algebraic difference between the determined data value and the data value in the temporary store corresponding to such individual data store;

(g) selecting in each processing means for each of the individual data stores at least one of the distance values from among the corresponding first and second distance values, such selected first or second distance value, for a particular data store, being the one that has a predetermined magnitude relative to the non-selected distance value for the same data store;

(h) forming in each processing means for the detected data value, from step (b), a sum-of-distance value representing the sum of the absolute values of the selected distance values which are formed in step (g) for the detected data value;

(i) designating in each of the processing means a new data value in the data store which contained the determined data value and repeating the steps (b)–(i) using such new data value as the designated data value recited in step (a),

the step of designating a new data value including the step of designating, in a predetermined order in the recited order of data values, the next data value from the one which was previously designated; and

(j) utilizing the determined data values and the corresponding sum-of-distance values provided in each processing means during steps (b)–(i) for deriving such criterion value and positional value.

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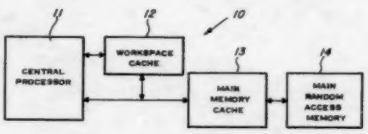
**4,382,278**

## HIERARCHIAL MEMORY SYSTEM WITH MICROCOMMAND MEMORY AND POINTER REGISTER MAPPING VIRTUAL CPU REGISTERS IN WORKSPACE CACHE #4 AND MAIN MEMORY CACHE

**Daren R. Appelt, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 5, 1980, Ser. No. 156,723**
**Int. Cl.³ G06F 9/22, 13/00**
**U.S. Cl. 364—200** **6 Claims**




1. A digital computer system having central processor unit and a microcommand memory for controlling the central processor unit, comprising:

(a) a main memory having a plurality of central processor unit working registers in at least one workspace;

(b) a workspace pointer register for indicating the location of the workspace;

(c) workspace cache memory means, corresponding to the

plurality of working registers in the workspace, connected to provide digital words to the central processor unit and to bilaterally exchange digital words with the plurality of working registers;

(d) indicia means indicating the presence or absence of digital words in the workspace cache memory means; and

(e) command means, responsive to the microcommand words from the microcommand memory for transferring the contents of the workspace cache memory means to the workspace in the main memory at the address indicated by the workspace pointer register and for transferring the contents of selected ones of the plurality of working registers to the workspace cache memory.

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**4,382,279**

## SINGLE CHIP MICROPROCESSOR WITH ON-CHIP MODIFIABLE MEMORY

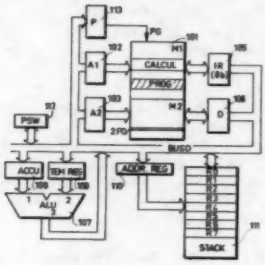
**Michel Ugon, Plaisir, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France**

**Continuation of Ser. No. 30,548, Apr. 16, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,463**

**Claims priority, application France, Apr. 25, 1978, 78 12119**

**Int. Cl.³ G06F *9/00***

**U.S. Cl. 364—200** **14 Claims**




1. A microprocessor comprising, on a single semiconductor chip,

a programmable read-only memory;

processing unit means for processing information contained in said programmable read-only memory; and

means controlled by said processing unit means for enabling data to be written in said programmable read-only memory.

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**4,382,280**

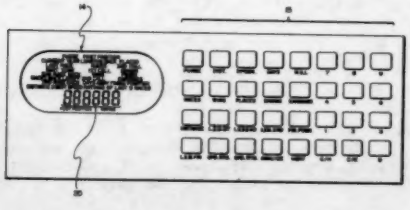
## ELECTRONIC HORSE RACE ANALYZER

**Evan W. Mandel, Rye, and William Quirin, Queensvillage, both of N.Y., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Dec. 30, 1980, Ser. No. 221,487**

**Int. Cl.³ G06F *15/28***

**U.S. Cl. 364—412** **5 Claims**



1. A portable electronic horserace analyzer comprising control means, means for furnishing information to the control means regarding the race and the histories of each of the horses in the race including for each horse the performance of that horse at a plurality of positions during at least one prior race relative to the leading horse in that prior race, and a display for presenting information generated by the control means indicative of the likelihood of certain horses winning the race.

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**4,382,281**

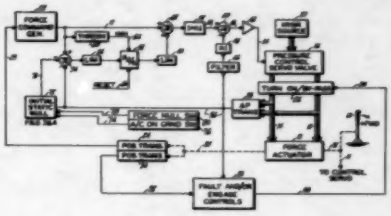
## HELICOPTER FORCE FEEL ACTUATOR AUTOMATIC STATIC NULL COMPENSATION

**Donald W. Fowler, West Haven; Raymond J. Brand, Oxford, and Douglas H. Clelford, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Aug. 8, 1980, Ser. No. 176,833**

**Int. Cl.³ B64C *13/04***

**U.S. Cl. 364—424** **2 Claims**



1. An aircraft control stick actuator system comprising:

a servo valve controlled hydraulic actuator connected to the control stick and operable to provide forces to the stick of a magnitude and direction proportional to electric signals provided to said servo valve;

pressure sensor means connected to said hydraulic force actuator to provide a pressure signal indicative of the force applied to said control stick;

means providing a position signal indicative of the position of the control stick;

means providing an aircraft on ground signal in response to the aircraft being on the ground;

means for providing a force nulling signal when control stick force feel actuator null offset error compensation bias is desired to be generated; and

signal processing means operative in response to presence of said aircraft on ground signal and said force nulling signal, for providing to said servo valve, in response to said position signal, desired stick position command signals to cause the control stick to move from a first position which is a significant fraction of control stick authority in one direction through null to a second position which is a significant fraction of control stick authority in a second direction and thence back through null to said first position, and responsive to said position signal and said pressure signal during a significant portion of control stick motion between said first and second positions for providing a static null signal which is indicative of the average pressure represented by the pressure signal during said significant portion of control stick motion.

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**4,382,282**

## TRIM CONTROL SYSTEM FOR REDUCED DRAG

**Donald E. Graham; Raymond A. Nelson, and Edmond E. Olive, all of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.**

**Filed Sep. 8, 1980, Ser. No. 185,096**

**Int. Cl.³ G06F *15/50*; G05D *1/08***

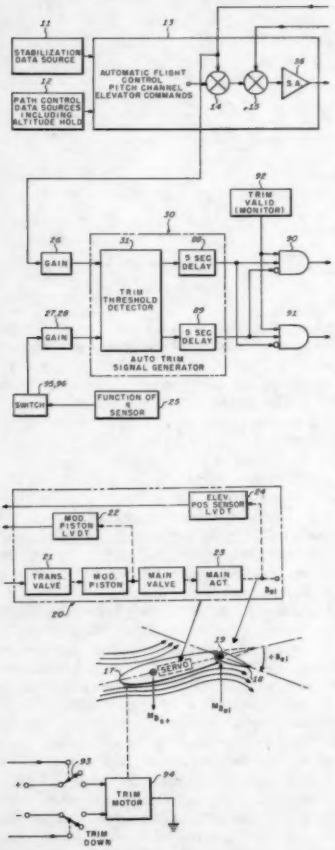
**U.S. Cl. 364—434** **5 Claims**

1. A reduced aerodynamic drag automatic stabilizer trim system for aircraft autopilots which includes switch means operable in one direction or the other depending upon sus-

tained elevator positions above or below predetermined threshold positions relative to said stabilizer for positioning said stabilizer so as to substantially streamline said elevator and maintain said aircraft on a predetermined flight path, the combination comprising:

(a) means for providing a signal corresponding to the magnitude and sense of elevator position relative to said stabilizer position; and

(b) trim threshold detector means, having first and second channels for providing at least first and second threshold values for each channel, responsive to said elevator position signal when said elevator position signal is in excess of either of said first threshold values, for operating said switch means to position said stabilizer in a direction to reduce the value of said elevator position signal to said second lower threshold values, said first and second threshold values of one of said trim threshold detector channels being substantially less than the first and second threshold values of the other of said trim threshold detector channels and the substantially lesser threshold values are dependent upon the polarity of said elevator position relative to said stabilizer position producing opposed pitching moments on said aircraft.

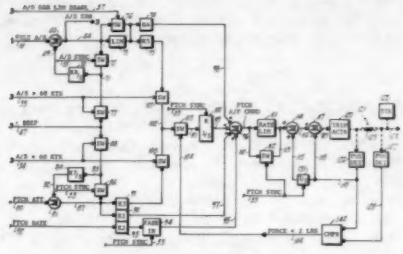



## 4,382,283

## HELICOPTER ATTITUDE AND AIRSPEED ACQUISITION AND RETENTION SYSTEM

**Douglas H. Clelford, and Richard D. Murphy, both of Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Aug. 8, 1980, Ser. No. 176,832**
**Int. Cl.³ G06F 15/50; B64C 11/34**
**U.S. Cl. 364—434** **7 Claims**



1. An airspeed hold autopilot system for a helicopter having a longitudinal cyclic pitch control stick with a trim release switch disposed thereon, comprising:

a trim actuator responsive to electrical signals applied thereto to position the longitudinal cyclic pitch control stick of the helicopter;

airspeed means for providing an airspeed signal indicative of actual helicopter airspeed;

trim means responsive to said trim release switch for providing a trim release signal;

position means responsive to said trim actuator for providing a stick trim position signal indicative of the longitudinal cyclic pitch stick trim position established by said trim actuator; and

signal processing means, responsive to said airspeed signal, said trim release signal, and said stick trim position signal, for providing in response to the presence of said trim release signal, an airspeed reference signal equal to said airspeed signal, and a stick synch signal equal to said stick trim position signal, for providing an airspeed error signal as the difference between said airspeed reference signal and said airspeed signal, for providing in the absence of said trim release signal a pitch autopilot command signal as a function of said airspeed error signal, and for providing a stick reference signal as a function of the difference between said pitch autopilot command signal and said stick synch signal and a stick command error signal applied to said trim actuator as a function of the difference between said stick reference signal and said stick trim position signal, whereby said stick command error signal can be zero during said trim release signal when said pitch autopilot command signal is zero valued and said airspeed reference signal is set equal to said actual airspeed signal so that said airspeed error signal consequently is zero valued, while said stick trim position signal retains a finite value indicative of current stick trim position.

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## 4,382,284

## COMMAND AND RESIDUAL PRIORITY CONTROL OF LOADS

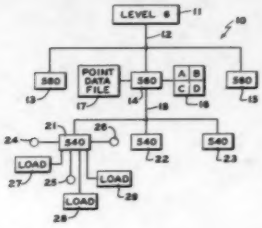
**Lawrence J. Dressel, Bloomington, Minn.; Richard A. Wruck, Mount Prospect, and Bruce D. Westphal, Oakwood Hills, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Apr. 15, 1981, Ser. No. 254,553**
**Int. Cl.³ G06F 9/18**
**U.S. Cl. 364—492** **4 Claims**

1. A system for controlling a plurality of loads based upon command and residual priorities comprising:

a plurality of loads;

control means for controlling said loads according to at least two programs, each program having a command priority used for a program which wants control of a load and a residual priority retained for the program having control, said control means comparing the command priority of the program wanting control of a load to the residual




priority of the program having control for thereby providing a command instruction to the load if said command priority of the program wanting control is greater than or equal to the residual priority of the program having control; and,

communication means connected between said control means and said loads for communicating the command instruction to said load.

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**4,382,285**

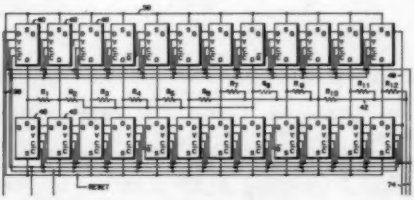
## FILTER FOR BINARY DATA WITH INTEGRAL OUTPUT AMPLITUDE MULTIPLIER

**Terence E. Sumner, Roselle, Ill.; James Ward, Mesa, Ariz., and Alan L. Wilson, Schaumburg, Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 30, 1980, Ser. No. 221,188**

**Int. Cl.³ G06F *15/34*; 333 *166***

**U.S. Cl. 364—724** **4 Claims**



1. A multiplying filter for digital data comprising:

a plurality of cascaded clocked latches, alternate latches of the plurality clocked oppositely so that pairs of adjacent latches form cascaded flip-flops;

a plurality of voltage-operated switches, one of each of the switches connected to an output of one of the latches;

a first voltage source connected to each of the plurality of switches and connected through upon a first signal from a latch;

a second voltage source connected to each of the plurality of switches and connected through upon a second signal from a latch;

a network of resistors, one of each of the resistors connected through one of the plurality of switches to one of the first and second voltage sources, the network having a central point that is an output of the filter.

**4,382,286**

## METHOD AND APPARATUS FOR COMPRESSING AND DECOMPRESSING STRINGS OF ELECTRICAL DIGITAL DATA BITS

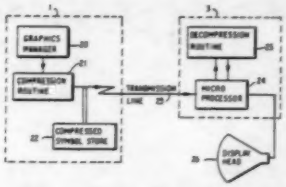
**Joan L. Mitchell, Ossining, N.Y., and Peter Quarendon, Romsey, England, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 30, 1980, Ser. No. 164,120**

**Claims priority, application United Kingdom, Oct. 2, 1979, 7934097**

**Int. Cl.³ G06F *5/00***

**U.S. Cl. 364—900** **6 Claims**




1. A method for compressing a binary bit string of a predetermined length comprising the steps of:

(a) dividing the bit string into a predetermined number of slices, each slice having a predetermined number of digits comprising a predetermined number of binary bits,

(b) comparing the bit string with a first comparison string of identical binary bits, and counting and storing the number of digits in which a mismatch occurs,

(c) comparing the bit string with at least a second comparison string which is the string to be compressed shifted by one slice so that each slice, except the first is compared with the previous slice in the string, and counting and storing the number of digits in which a mismatch occurs,

(d) choosing as a coding basis that comparison string which provided the least number of mismatches of digits,

(e) generating a header code indicating which comparison string has been chosen, and

(f) generating a string of binary bits having a single flag bit for each successful digit comparison and a different flag bit plus the full digit for each non-successful digit comparison.

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**4,382,287**

## PSEUDO-SYNCHRONIZED DATA COMMUNICATION SYSTEM

**Mark E. Ackman, Cockeysville, Md.; Wayne L. Dufek, North Hopewell Township, York County, Pa.; Charles C. McCarthy, Baltimore, Md., and Edward E. Kopicky, Bel Air, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jul. 15, 1980, Ser. No. 168,997**

**Int. Cl.³ G06F *15/46***

**U.S. Cl. 364—900** **5 Claims**

1. A data communication system comprising:

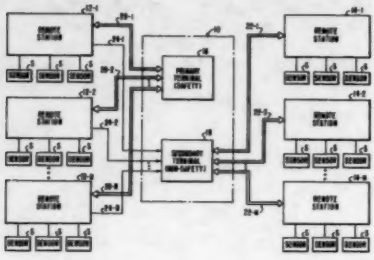
(A) a plurality of remote stations each including means for gathering and storing data;

(B) a primary terminal having a plurality of two-way data communication links and being in two-way data communication with said remote stations, including means for addressing said remote stations in a predetermined sequence and means for requesting and receiving stored data from said addressed remote stations thru said two-way data communication links;

(C) a secondary terminal in one-way data communication with said remote stations and including a plurality of one-way-only data communication links each for receiving stored data transmitted by a respective of said addressed remote stations;

(D) said secondary terminal including data utilization means coupled to the one-way data communication links;

(E) said secondary terminal additionally including gating means for each said one-way-only data link and operable, when enabled, to gate received data to said data utilization means;



(F) said secondary terminal further including means for enabling a selected one of said gating means and, after receipt of data by said selected gating means, enabling the remainder of said gating means in said same predetermined sequence in which said remote stations are addressed by said primary terminal.

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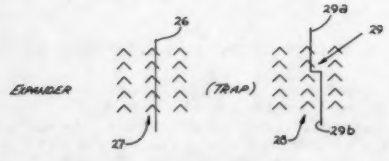
4,382,288

## THIN FILM MAGNETIC BUBBLE DETECTOR

Peter J. Silverman, Palo Alto, Calif., assignor to Intel Magnetics, Inc., Santa Clara, Calif.

Filed Nov. 12, 1981, Ser. No. 320,601
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—8 12 Claims




5. A magnetic bubble detector comprising:

a first propagation element for receiving expanded magnetic bubbles;

an active detection member insulated from said first element and aligned with respect to said first element so as to detect magnetic bubbles propagated by said first element;

a second propagation element;

a dummy detection member insulated from said second propagation element, said dummy member including a first portion which is aligned with respect to said second element in the same manner as said alignment between said first element and said active member and a second portion differently aligned with respect to said second element;

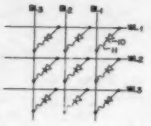
whereby the signal from said dummy member can be used for more reliable detection of bubbles propagated by said first element.

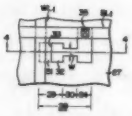
4,382,289

## SEMICONDUCTOR MEMORY DEVICE

Shinji Saitoh, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 2, 1981, Ser. No. 298,875
Claims priority, application Japan, Oct. 7, 1980, 55/139375
Int. Cl.[3] G11C *17/00*
U.S. Cl. 365—96 4 Claims





1. A semiconductor memory device which comprises:

an insulation layer; and

a plurality of polycrystalline silicon layer regions formed on said insulation layer, and

wherein each polycrystalline silicon layer region includes a semiconductor element region and a semiconductor fuse region containing a meltable fuse link; and said semiconductor element region and said semiconductor fuse region are integrated with each other to constitute a memory cell of said semiconductor memory device.

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4,382,290

## APPARATUS FOR ACOUSTICALLY INVESTIGATING A BOREHOLE

R. Mark Havira, New Fairfield, Conn., assignor to Schlumberger Technology Corporation, Tex.

Division of Ser. No. 911,016, May 30, 1978, Pat. No. 4,255,798, which is a continuation-in-part of Ser. No. 814,588, Jul. 11, 1977, abandoned. This application Jun. 30, 1980, Ser. No. 164,073
Int. Cl.[3] G01V *1/40, 1/00*
U.S. Cl. 367—35 4 Claims

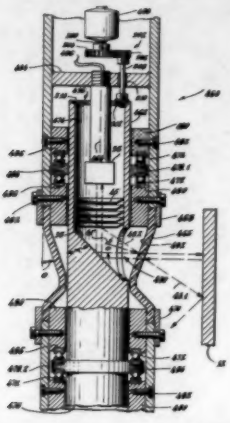
1. In an acoustic borehole investigating tool having an acoustic transducer for directing acoustic energy at a rotating reflector to acoustically investigate a radially remote wall with acoustic returns being reflected off the rotating reflector onto the acoustic transducer, the improvement comprising

said tool being formed of upper and lower tool sections;

an annular acoustically transparent window mounted to and between the upper and lower tool sections;

a cylinder mounted for rotation about an axis to and inside the upper tool section and having sufficient axial length to internally bridge the annular transparent window and rotatably engage and structurally reinforce the lower tool section at the inside thereof, said cylinder having a tubular section with a side located opening radially opposite said annular transparent window, said tubular section com-

mencing at the upper tool section and internally supporting said reflector radially opposite said side located open-



ing to enable acoustic communication through the annular window.

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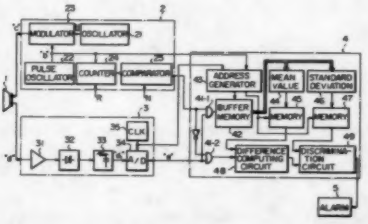
4,382,291

## SURVEILLANCE SYSTEM IN WHICH A REFLECTED SIGNAL PATTERN IS COMPARED TO A REFERENCE PATTERN

Shunsaku Nakauchi, Mitaka, Japan, assignor to Secom Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 198,114
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—93 6 Claims




1. A surveillance system for detecting an unauthorized object or person in an area under surveillance, comprising:

means for transmitting a radiation energy signal, intermittently, to said area under surveillance;

means for receiving reflections from said area under surveillance and converting analog signals of said reflections into digital signal patterns;

means, connected to said receiving means, for storing a plurality of said digital signal patterns for a predetermined time;

means, connected to said storing means, for forming a reference pattern from said plurality of stored digital signal patterns in said storing means; and

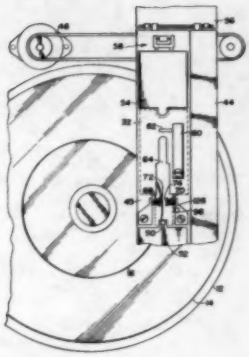
means, connected to said receiving means and said reference pattern forming means, for comparing a digital signal pattern from said receiving means with said reference pattern of said reference pattern forming means and for activating an alarm when said digital signal pattern and said reference pattern are different.

4,382,292

## VIDEO DISC PLAYER HAVING STYLUS POSITION SENSING APPARATUS

Byron K. Taylor, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 55,648, Jul. 9, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,571
Int. Cl.³ G11B *3/38*
U.S. Cl. 369—43 2 Claims



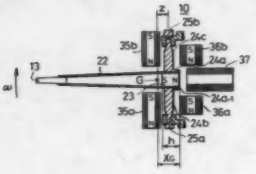
1. A system for recovering prerecorded signals during playback from a disc record having information recorded thereon along a spiral track disposed on the surface thereof by means of a track-following stylus incorporating a pickup electrode; said record having a conductive property; said stylus being disposed at one end of a stylus arm; a compliant member securing the other end of said stylus arm to a pickup cartridge; a planar, conductive flylead having one end attached to said stylus pickup electrode, and having its other end secured to a first terminal disposed on said cartridge such that a narrow edge of said flylead is arranged in a plane disposed substantially perpendicularly to the plane of said record during playback; said system including a carriage subject to translation along a path disposed radially of said disc record; a first means housed in said carriage for sensing a signal indicative capacitance formed between said pickup electrode and said conductive property of said record for providing said prerecorded signals at an output terminal thereof; said first means having an input terminal; said carriage having a compartment for removably receiving said pickup cartridge; said first cartridge terminal being subject to engagement with said input terminal of said first means upon reception of said cartridge in said carriage compartment; a second means housed in said carriage and modulated at a given frequency rate; a conductive element coupled to said given frequency modulated means, and fixedly mounted in said carriage such that said conductive element is juxtaposed to said narrow edge of said stylus-mounted flylead when said stylus is disposed in a playback relationship with respect to said record; said narrow edge of said stylus-mounted conductive flylead and said fixedly-mounted conductive element defining a stylus position indicative capacitance; said first means, coupled to said flylead, additionally serving to sense said stylus position indicative capacitance modulated at said given frequency rate for generating a stylus position representative signal at said output terminal of said first means.

4,382,293

## SIGNAL PICKUP DEVICE IN ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Osamu Tajima, and Takefumi Shioiri, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 14, 1981, Ser. No. 254,055
Int. Cl.³ G11B 3/38, 21/10
U.S. Cl. 369—43 6 Claims



1. A signal pickup device in a rotary recording medium recording apparatus comprising:

a cantilever having at a free distal end thereof a reproducing element for reproducing recorded signals from tracks of a rotary recording medium;

a permanent magnet magnetized in an axial direction of said cantilever and fixed to said cantilever at proximal end thereof;

an elastic support member extending perpendicular to a longitudinal direction of said tracks and supporting the proximal end of said cantilever, said cantilever being rotatable, accompanied by elastic deformation of said elastic support member; and

tracking control coil means supplied with a tracking control current to attract and repulse said permanent magnet to cause said cantilever to rotate, said reproducing element being displaced in a direction perpendicular to the longitudinal direction of the recording tracks of said rotary recording medium to trace the tracks,

said tracking control coil means comprising at least a single rear-side tracking coil disposed at a position opposite to said reproducing element with respect to said elastic support member to confront a magnetic pole of said permanent magnet and at least a single front-side tracking coil disposed at a position toward said reproducing element with respect to said elastic support member to confront an opposite magnetic pole of said permanent magnet, with the axes of said rear-side and front-side tracking coils being arranged in a direction perpendicular to an axial direction of said cantilever.

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4,382,294

## TELEPHONE SWITCHING CONTROL ARRANGEMENT

Hugo J. Beuscher, Glen Ellyn, and Maurice N. Ransom, Naperville, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 26, 1981, Ser. No. 315,005
Int. Cl.³ H04J 3/12; H04Q 11/04; H04J 3/14
U.S. Cl. 370—16 13 Claims

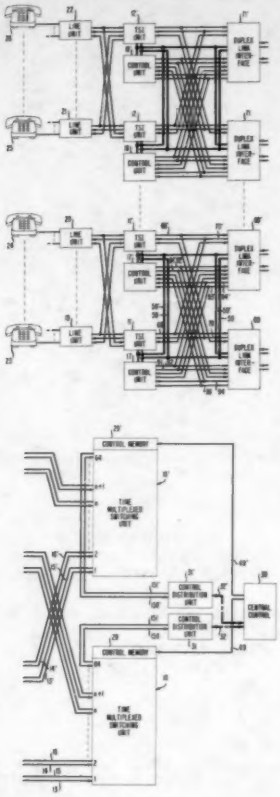
1. A time division switching system comprising

a control arrangement comprising means for transmitting and receiving control messages,

a plurality of interface modules each comprising means for transmitting and receiving data words representing subscriber-generated information and for transmitting and receiving control messages,

a first and a second time-shared space division switch, and

means for controlling said first and second time-shared space division switches and said plurality of interface modules such that said first time-shared space division switch selectively conveys data words representing subscriber-generated information among said interface modules and conveys control messages among said interface modules and said control arrangement and such that said second



time-shared space division switch conveys predetermined ones of said control messages among said interface modules and said control arrangement.

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4,382,295

## DIGITAL CONFERENCE TIME SLOT INTERCHANGER

Bryan S. Moffitt, Eatontown, N.J., and Alexander R. Ross, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 23, 1981, Ser. No. 256,970
Int. Cl.³ H04M 3/56; G06F 7/00; H04Q 11/04
U.S. Cl. 370—68 25 Claims

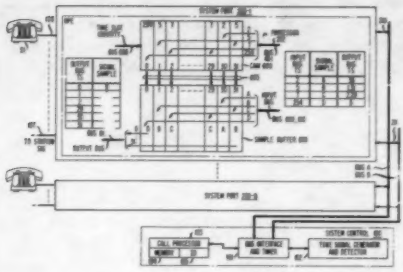
1. A circuit for transferring signals between an input and an output, said input and output having established thereat a plurality of time shared positions, each position having a unique identity, said circuit characterized in that there is included

a first memory having address locations therein each location corresponding to a particular one of said output time positions, each location adapted to store thereat the identity of an input time position,

means for establishing address inputs for said first memory, said inputs consisting of the identities of said input time positions, and

means controlled by a match between an established address input and a stored time position identity at a particular location within said first memory for transferring a signal

from the input time shared position corresponding with said matched time position identity to the output time



shared position corresponding with said particular first memory storage location.

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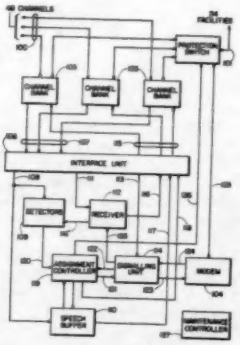
**4,382,296**

**BUFFERING SPEECH SIGNALS IN A TASI SYSTEM**

**Robert H. Joyce, Menlo Park, Calif.; David H. A. Black, Chelsea, and Franz O. Plangger, Gatineau, both of Canada, assignors to Northern Telecom Limited, Ottawa, Canada**

**Filed Dec. 22, 1980, Ser. No. 218,756**
**Claims priority, application Canada, Oct. 3, 1980, 361497**
**Int. Cl.³ H04J** *5/00*
**U.S. Cl. 370—81** **17 Claims**



1. A method of buffering speech signals in a TASI system in which speech signals from a plurality of channels are interpolated for transmission via a lesser plurality of facilities, comprising, for each channel which is active, the steps of:

providing storage packets of a buffer as required for storage of signals of the channel;

storing signals of the channel sequentially in said packets; and

upon assignment of a transmission facility to the channel for transmission of the signals of the channel, reading the signals of the channel sequentially from said packets for transmission via the facility.

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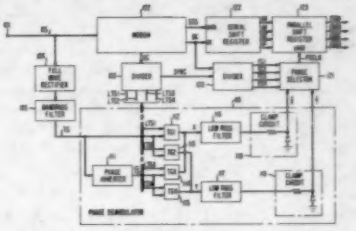
**4,382,297**

**DEMULTIPLEX RECEIVER APPARATUS**

**Cecil W. Farrow, Highlands, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 24, 1980, Ser. No. 200,412**
**Int. Cl.³ H04J** *3/06*
**U.S. Cl. 370—112** **7 Claims**



1. Receiver apparatus of the type including means (102) responsive to an input signal (RS) for generating a corresponding serial bit stream (SDS) having a plurality of bits arranged in consecutive symbols and also for generating a symbol clock signal (SC) having a first pulse rate related to a rate of occurrence for each symbol and a bit clock signal (BC) having a second pulse rate related to a rate of occurrence for each bit in the corresponding serial bit stream, the serial bit stream also capable of being partitioned into consecutive frames, the receiver apparatus characterized by,

means (120) responsive to the bit clock signal for generating at least one frame clock signal (e.g., FC1, FC2, FC3, FC4) having a third pulse rate related to a rate of occurrence of consecutive frame, in the corresponding serial bit stream, wherein M/N is a nonintegral rational number,

means (104, 105) responsive to the input signal for generating a timing signal (TS) having a pulse rate related in a prescribed manner to the first and third pulse rates, and

means (103, 110, 121) jointly responsive to the symbol clock signal and the timing signal for controlling the at least one frame clock signal to have a phase synchronized with a predetermined bit position ($A_0$, $A_1$, $A_2$, $A_3$) of each frame, so that a predetermined transition of the frame clock signal occurs at the predetermined bit position of each frame in the corresponding serial bit stream.

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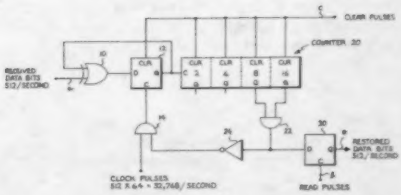
**4,382,298**

**BINARY DIGIT OR BIT RESTORATION CIRCUIT**

**Michael W. Evans, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.**

**Filed Mar. 27, 1981, Ser. No. 248,493**
**Int. Cl.³ H03K** *13/32*
**U.S. Cl. 371—6** **5 Claims**



1. An improved circuit for regenerating relatively accurate two-level bit pulses of predetermined period T from distorted two-level bit pulses of said period T comprising:

a. means for sampling the level of said distorted bit pulses a selected plurality of times during each of said periods T;

b. means coupled to said sampling means for counting said samples of a first selected level during the interval beginning a first period of time later than the beginning of each period T and ending a second period of time earlier than the ending of each period T, said counting means being reset prior to each of said intervals, and said counting means being maintained in a fixed condition in response to a predetermined count being reached during each of said intervals;

c. and output means coupled to said counting means for producing a bit pulse of period T having said first selected level in response to at least said predetermined count and for producing a bit pulse of period T having a second selected level in response to less than said predetermined count.

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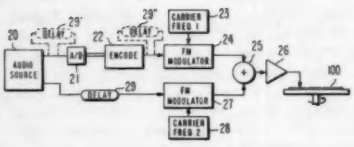
**4,382,299**

## DISC RECORD SYSTEM EMPLOYING SIGNAL REDUNDANCY

**Charles B. Dieterich, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 7, 1980, Ser. No. 204,826**
**Int. Cl.³ G06F *11/10*; H04N *5/76***
**U.S. Cl. 371—8** **12 Claims**




1. In an apparatus for recording high density recording media with audio signals for subsequent recovery by a compatible playback apparatus, the combination comprising:

a source of analog audio signal;

first and second sources for providing first and second carrier signals respectively;

an analog-to-digital converter responsive to said analog signal for generating a digital manifestation thereof;

means for encoding the digital manifestation of the analog signal to permit detection of errors in recovered signal by said playback apparatus;

means for temporally delaying the analog audio signal relative to the encoded digital manifestation thereof;

means responsive to said encoded digital manifestation of the analog signal for modulating said first carrier signal;

means responsive to said delayed analog signal for modulating said second carrier signal therewith;

means responsive to the first and second modulated carriers for providing the linear sum thereof;

means responsive to said linear sum for conditioning the linear sum for application to a recording mastering transducer, and wherein

the temporal relationship of the digital and analog manifestation of the audio signal permits preferential recovery of the encoded digital signal manifestation in said compatible playback apparatus, and substitution of recovered delayed analog audio signal when errors occur in recovered digital signal.

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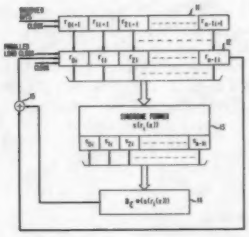
**4,382,300**

## METHOD AND APPARATUS FOR DECODING CYCLIC CODES VIA SYNDROME CHAINS

**Dev V. Gupta, Indianapolis, Ind., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.**

**Filed Mar. 18, 1981, Ser. No. 244,881**
**Int. Cl.³ G06F *11/12***
**U.S. Cl. 371—37** **9 Claims**



1. Apparatus for decoding cyclic codes that may incorporate one or more errors comprising first register means for receiving a cyclic code word, second register means for storing the code word received by the first register means, means for forming the syndrome of the code word stored in the second register means, means responsive to said syndrome for determining whether the last bit of the stored code word is in error, means for modulo-2 adding the output of the determining means with said last bit to provide a correct version of the last bit, means for shifting the output of the modulo-2 means into the input of the second register means, and means for repeating the correction operation a predetermined number of times at the end of which the maximum likely code word is present in the second register means, said forming means comprising means for forming successive syndrome chains of multiple syndromes each to correct errors in a received cyclic code word.

# DESIGN PATENTS

## GRANTED MAY 3, 1983

### ERRATA

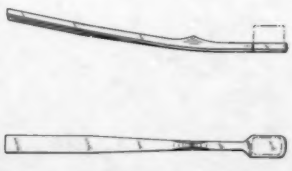
| For CLASS | See PATENT NO. |
|---|---|
| D7–300 | 268,840 |
| D7–398 | 268,841 |

# DESIGNS

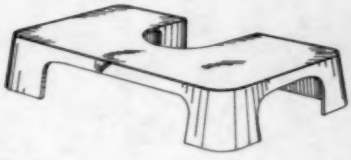
## MAY 3, 1983

268,794
SUSHI
Koki Uno, Tokyo, Japan, assignor to Kyotaru Co., Ltd., Tokyo, Japan
Filed Dec. 12, 1980, Ser. No. 215,745
Claims priority, application Japan, Jun. 26, 1980, 55-025288
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—2

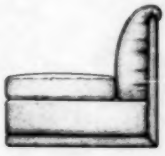
268,795
TOOTHBRUSH
Yoshitomo Ohama, Scarsdale, N.Y., assignor to Avon Products, Inc., New York, N.Y.
Filed Jan. 19, 1981, Ser. No. 226,270
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



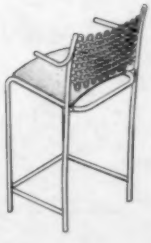
268,796
TOILET FOOT-STOOL FOR CHILDREN
Tapani Kola, Balladvägen 9, Uddevalla, Sweden (451 71)
Filed Oct. 27, 1980, Ser. No. 201,235
Claims priority, application Sweden, Apr. 28, 1980, 80-857
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—5



268,797
CHAIR
John Mascheroni, 200 E. 64th St., New York, N.Y. 10021
Filed Aug. 29, 1979, Ser. No. 70,777
The portion of the term of this patent subsequent to Apr. 27, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



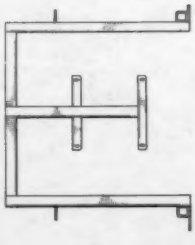
268,798
COUNTER ARMCHAIR
David L. Rowland, 8 E. 62nd St., New York, N.Y. 10021
Filed Jun. 10, 1980, Ser. No. 158,328
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72



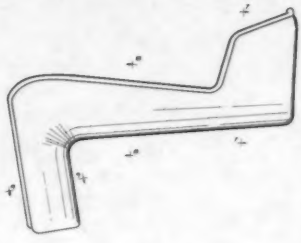
268,799
ARMCHAIR
Saul Feldberg, Downsview, Canada, assignor to Global Upholstery Company Limited, Downsview, Canada
Filed Oct. 20, 1980, Ser. No. 198,964
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

268,800
TABLE
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Apr. 27, 1981, Ser. No. 257,722
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

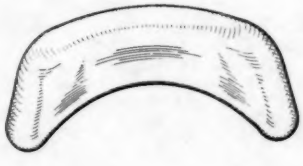
268,801
TABLE A-FRAME FOR A BOOTH SEATING SYSTEM
Scott D. Crowe, 715 W. Longden Ave., Arcadia, Calif. 91106, assignor to Scott D. Crowe, Camarillo, Calif.
Filed Mar. 19, 1981, Ser. No. 245,581
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



268,802
COMBINED LEG AND FOOT SUPPORT
Loel Fenwick, S. 161 Adams, Spokane, Wash. 99204
Filed Mar. 31, 1980, Ser. No. 135,871
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—200

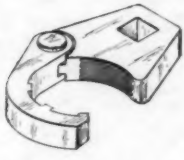


268,803
BACK REST
Frank L. Roberts, c/o Obus Forme 170 St. George St., Toronto, Ontario, Canada (M5R 2M8)
Filed Jul. 15, 1980, Ser. No. 169,227
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—200

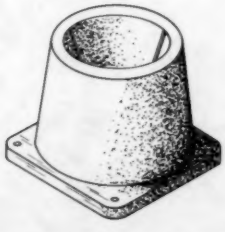


268,804
BED SHEET TUCKING DEVICE
James D. Bacon, 2004 6th Pl., SW., Largo, Fla. 33540
Filed Jul. 28, 1980, Ser. No. 173,092
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—292

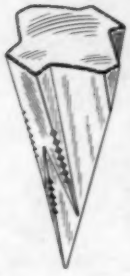
268,805
WRENCH
Frank A. Kowalewicz, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Sep. 8, 1980, Ser. No. 184,579
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—27



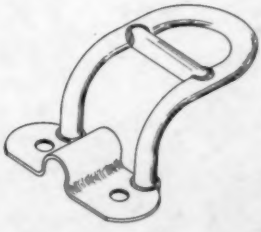
268,806
BOTTLE CAP REMOVER
Philip G. Love, 603 Greystone Village Apartments, Scottsboro, Ala. 35768
Filed May 4, 1981, Ser. No. 260,011
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—37



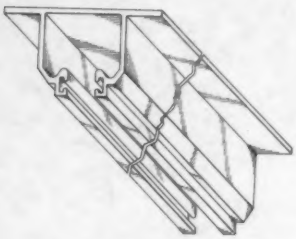
268,807
SPLITTING DEVICE WITH VARYING CROSS SECTIONS
Michael J. Reynolds, 1115 Stonewood Ct., Gladstone, Oreg. 97027, assignor to Michael J. Reynolds, Gladstone, Oreg.
Filed Jul. 10, 1981, Ser. No. 259,592
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—47



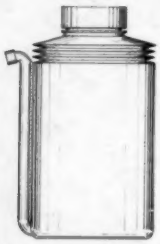
268,808
BOLT GUARD
William Wesener, Jr., 16901 Palomino Dr., Hemlock, Mich. 48626
Filed Dec. 16, 1980, Ser. No. 216,990
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—346



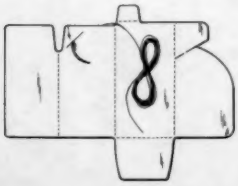
268,809
TRACK FOR AN ACCORDION TYPE FOLDING DOOR
John D. Marontate, Corner 19th and A St., Forest Grove, Oreg. 97116
Filed Dec. 8, 1980, Ser. No. 214,329
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—377



268,810
SQUEEZE BOTTLE
Philip F. Hartung, Dean Building, 655 Main St., East Greenwich, R.I. 02818
Filed Nov. 13, 1980, Ser. No. 206,495
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—301



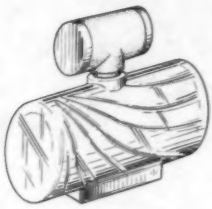
268,811
SURGICAL SUTURE PACKAGE
Seymour Black, West Hartford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Jan. 14, 1981, Ser. No. 224,868
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—303



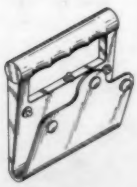
268,812
BOTTLE
Henri D'Orleans, Paris, France, assignor to L'Oreal, Clichy, France
Filed Nov. 6, 1980, Ser. No. 204,576
Claims priority, application France, May 5, 1980, 801,432
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—335

268,813
COMBINED CONTAINER AND CAP WITH ATTACHED SPOON
Ronald L. Horsley, 1805 E. 14th St., San Leandro, Calif. 94577
Division of Ser. No. 914,913, Jun. 12, 1978. This application Dec. 12, 1979, Ser. No. 102,952
Term of patent 14 years
Int. Cl. D09—*01*
U.S. Cl. D9—337

268,814
BOTTLE
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jul. 24, 1980, Ser. No. 171,786
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—384



268,815
CARRYING HANDLE FOR A CARTON OR THE LIKE
Richard I. Schwalbach, 2223 Pierce Ave., NE., Minneapolis, Minn. 55418
Filed Feb. 17, 1981, Ser. No. 234,793
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434

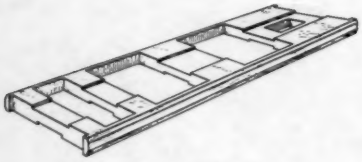


268,816
POCKET WATCH
Jacob W. M. Venker, Hilversum, Netherlands, assignor to Almere Projects B.V., Almere, Netherlands
Filed Jun. 6, 1978, Ser. No. 913,214
Claims priority, application Benelux, Dec. 8, 1977, 0348600
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—37

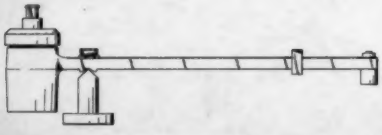
268,817
FILL HEIGHT GAUGE
Norman L. Watts, Baldwinsville; Robert J. Clark, Syracuse, and Fred C. Harvey, Baldwinsville, all of N.Y., assignors to Miller Brewing Company, Milwaukee, Wis.
Filed Feb. 17, 1981, Ser. No. 234,892
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

268,818
FILL HEIGHT GAUGE
Norman L. Watts, Baldwinsville; Robert J. Clark, Syracuse, and Fred C. Harvey, Baldwinsville, all of N.Y., assignors to Miller Brewing Company, Milwaukee, Wis.
Filed Feb. 17, 1981, Ser. No. 234,897
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

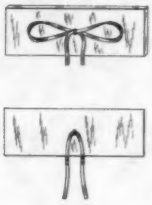
268,819
ROUTER PATTERN
Merle R. Ellis, Rte. No. 2, Box 248-60, Greensboro, N.C. 27405
Filed May 4, 1981, Ser. No. 259,851
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



268,820
PRESSURIZED DENSITY MEASURING APPARATUS
David E. Cain, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.
Filed Mar. 9, 1981, Ser. No. 242,112
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83



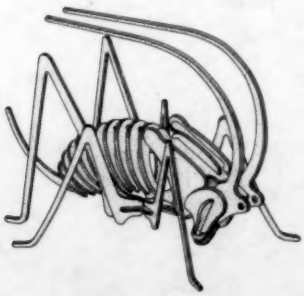
268,821
BROOCH OR THE LIKE
Darlan R. Little, 2143 W. Vienna Rd., Clio, Mich. 48420
Filed Aug. 25, 1980, Ser. No. 180,951
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—74



268,822
FIGURINE OF A DALMATIAN
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Oct. 20, 1980, Ser. No. 198,867
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

268,823
ANT FIGURE
Tatsuya Kodaka, 25-6, Wakamiya 1-chome, Nakano-ku, Tokyo, Japan
Filed Jun. 5, 1981, Ser. No. 270,975
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

268,824
CRICKET FIGURE
Tatsuya Kodaka, 25-6, Wakamiya 1-chome, Nakano-ku, Tokyo, Japan
Filed Jun. 5, 1981, Ser. No. 270,978
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

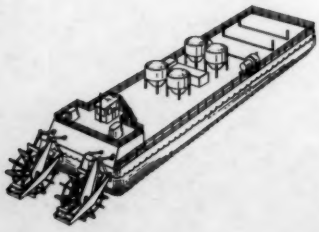


268,825
FIGURINE
Donald L. Larson, Star Route #2, Box 261, Trout Creek, Mont. 59874
Filed Aug. 10, 1981, Ser. No. 291,524
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

268,826
FIGURINE OF A DOVE
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Oct. 20, 1980, Ser. No. 198,869
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

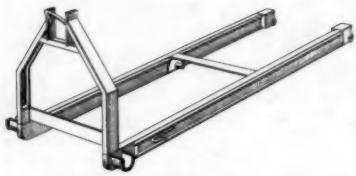
268,827
MANTIS FIGURE
Tatsuya Kodaka, 25-6, Wakamiya 1-chome, Nakano-ku, Tokyo, Japan
Filed Jun. 5, 1981, Ser. No. 270,977
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

268,828
AIR CUSHION VEHICLE
Daniel G. W. Turner, Romsey, England, assignor to Phoenix Hovercraft Corp., Houston, Tex.
Filed Oct. 16, 1980, Ser. No. 197,427
Claims priority, application United Kingdom, Apr. 19, 1980, 994561/80
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5

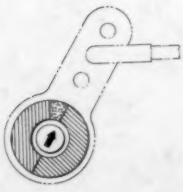


268,829
MINI-VEHICLE
Jean Dassesse, Avenue des Ormeaux, 24, and Jacques Wybauw, Avenue Brunard, 41, both of Brussels, Belgium
Filed Sep. 9, 1980, Ser. No. 185,573
Claims priority, application Benelux, Mar. 10, 1980, 2126
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91

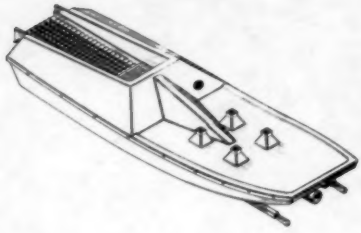
268,830
EXCHANGE PLATFORM FRAME FOR MOUNTING ON THE FRAME OF A TRUCK OR THE LIKE
Leo Sutela, Turku, Finland, assignor to Oy Partek AB, Finland
Filed Aug. 15, 1980, Ser. No. 178,366
Claims priority, application Finland, Apr. 11, 1980, 288/80
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—93



268,831
WEAR AND ADJUSTMENT INDICATOR FOR VEHICLE BRAKES SYSTEM
Sterling L. Potter, 7419 April St., Orangevale, Calif. 95662
Filed Sep. 22, 1980, Ser. No. 189,040
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180



268,832
FLOATING GOLD DREDGE
Donald L. Albright, Auburn; Wade E. Hampton, Rio Linda, and Guy D. Schroeder, New Castle, all of Calif., assignors to Rainbow Mining and Manufacturing, Incorporated, New Castle, Calif.
Filed Sep. 15, 1980, Ser. No. 187,197
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—300



268,833
SHEET-METAL HEAT SINK FOR ELECTRONIC SEMICONDUCTOR DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Auvid Engineering, Inc., Laconia, N.H.
Filed Apr. 8, 1981, Ser. No. 252,032
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

268,834
SWITCH GUARD FOR HEATER CONTROL UNIT
Lloyd V. Smith, Cathedral City, Calif., assignor to Western Control Equipment Co., Garden Grove, Calif.
Filed Apr. 14, 1980, Ser. No. 140,204
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

268,835
HEAT SENSITIVE SWITCH
Brent A. Pennington, 833 Southway Cir., Fort Worth, Tex. 76115
Filed Oct. 23, 1980, Ser. No. 199,692
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

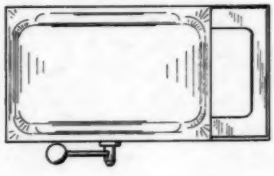
268,836
SWITCH
Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-chome, Ohta-ku, Tokyo, Japan
Filed May 14, 1981, Ser. No. 263,614
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—37

268,837
SWITCH
Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-chome, Ohta-ku, Tokyo, Japan
Filed May 14, 1981, Ser. No. 263,615
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—37

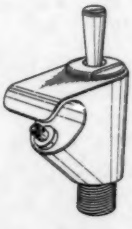
268,838
SWITCH
Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-chome, Ohta-ku, Tokyo, Japan
Filed May 14, 1981, Ser. No. 263,616
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—37

268,839
TELEPHONE ENCLOSURE
Erwin R. Wendorff, 1 Walnut Hollow La., Lincroft, N.J. 07738
Filed Apr. 16, 1980, Ser. No. 141,131
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

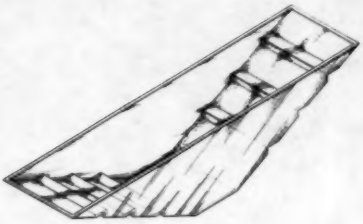
268,840
FROZEN COMESTIBLES DISPENSER HOUSING
Claude A. Reed, Omaha, Nebr., assignor to Whirla Whip Marketing Corporation, Omaha, Nebr.
Filed Jul. 6, 1981, Ser. No. 280,233
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—300



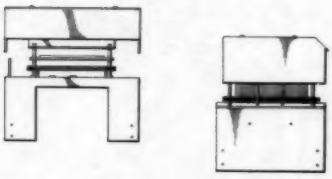
268,841
DRINKING FOUNTAIN BUBBLER
John F. Adams, Warley, England, assignor to H. E. Rudge & Co. Ltd., Birmingham and Assoc. Builders Merchants, Limited, Essex, both of, England
Filed May 12, 1980, Ser. No. 149,140
Claims priority, application United Kingdom, Apr. 3, 1980, 994359
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—398



268,842
ORE CONCENTRATING TRAY
Charles O. Gordon, Jr., Montclair, Calif., assignor to Joseph W. Montigny, El Monte, Calif.
Filed Jun. 23, 1980, Ser. No. 162,378
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147

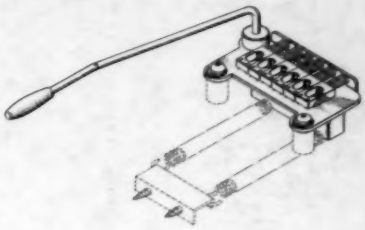


268,843
COMBINATION PLANAR MOLDER
Verle L. Rice, 700 S. Halsey, and Dwight E. Check, 702 E. Pearl, both of Harrisonville, Mo. 64701
Filed Mar. 9, 1981, Ser. No. 241,710
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—127



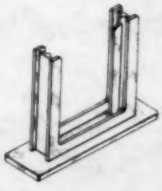
268,844
STRING INSTRUMENT PICK
Mathew McPherson, Sr., 103 N. 6th St., Henderson, Minn. 56044
Filed Oct. 31, 1980, Ser. No. 202,597
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

268,845
VIBRATO BRIDGE FOR STRINGED MUSICAL INSTRUMENTS
C. Leo Fender, 1510 Dana Pl., Fullerton, Calif. 92635
Filed Jul. 1, 1980, Ser. No. 165,073
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21



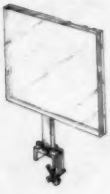
268,846
CONTROL KNOB FOR AN OFFICE MACHINE
John E. Jolliffe, Manlius, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Aug. 3, 1981, Ser. No. 289,433
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12

268,847
CALENDAR HOLDER OR SIMILAR ARTICLE
John C. Hollister, Sr., deceased, late of Napa, Calif., by Carol S. Hollister, legal representative, P.O. Box 2605, Napa, Calif. 94558
Filed Jul. 11, 1980, Ser. No. 168,177
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—20



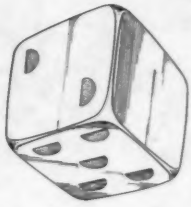
268,848
TAB FOR INDEX CARDS
Kurt Lorber, Aichwald, Fed. Rep. of Germany, assignor to Laurel-Plastic Kurt Lorber, Fed. Rep. of Germany
Filed Jan. 22, 1981, Ser. No. 227,338
Claims priority, application Fed. Rep. of Germany, Aug. 15, 1980, GR II 1142/80
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—99

268,849
DISPLAY CARD HOLDER
Bernard E. Shuman, Merrick, N.Y., assignor to Eastern Electrical Equipment, Hicksville, N.Y.
Filed Dec. 2, 1980, Ser. No. 212,200
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—43

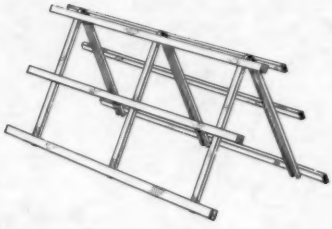


268,850
COMBINED CHESS GAME BOARD AND GAME PIECE HOLDER OR THE LIKE
Dragan Vukadinovic, 4812 Woodrow Ave., Parma, Ohio 44134
Filed Jan. 23, 1981, Ser. No. 227,946
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—23

268,851
PLAYING DIE
Franklin G. Mack, Baltimore, Md., assignor to Gil Designs, Ltd., Baltimore, Md.
Filed Sep. 15, 1980, Ser. No. 189,857
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



268,852
BINGO CARD RACK
Allen B. Rasmussen, 11131 S. Valley View, Whittier, Calif. 90604
Filed Jan. 5, 1981, Ser. No. 222,602
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—57

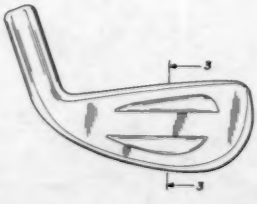


268,853
GAME BALL
William H. Brine, Jr., Weston, Mass., assignor to W. H. Brine Company, Milford, Mass.
Filed Feb. 9, 1981, Ser. No. 232,662
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—205

268,854
NOVELTY PADDLE
Maxwell E. Benedict, 6125 Shenandoah Dr., Sacramento, Calif. 95841
Filed Feb. 19, 1981, Ser. No. 235,905
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213

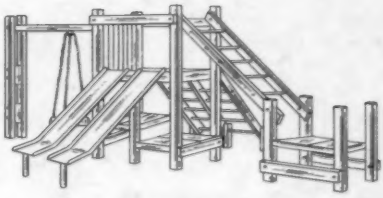
268,855
GOLF PUTTER HEAD
George M. Nehrbas, Jr., 203 Broadway St., Bethpage, N.Y. 11714
Filed Sep. 2, 1980, Ser. No. 183,124
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

268,856
GOLF CLUB HEAD
Lin Fisher, Dallas, Tex., assignor to Foxbat Precision Golf Equipment, Dallas, Tex.
Filed Apr. 9, 1981, Ser. No. 252,321
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220



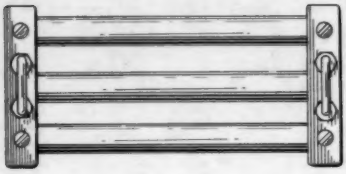

268,857
TWO WHEEL ROLLER SKATE
Paul M. Tollens, 5824 Denny Ave., North Hollywood, Calif. 91601
Filed Feb. 26, 1981, Ser. No. 238,534
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

268,858
OUTDOOR RECREATIONAL DEVICE
Michael L. Works, 7814 N. Boulevard, Tampa, Fla. 33604
Filed May 30, 1980, Ser. No. 154,611
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244



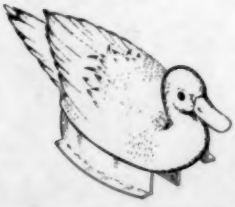
268,859
PLAYGROUND SLIDE
Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa
Division of Ser. No. 77,356, Sep. 20, 1979, Pat. No. Des. 262,230. This application Feb. 5, 1981, Ser. No. 231,735
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244

268,860
SWING SEAT
Jack F. Yevak, 715 Coronet, San Antonio, Tex. 78216
Filed Feb. 9, 1981, Ser. No. 233,005
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—246

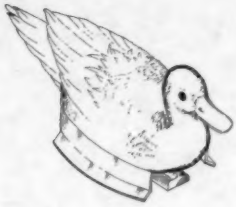


268,861
FIREARM MUZZLE BRAKE OR SIMILAR ARTICLE
Mack W. Gwinn, Jr., Levant, Me., assignor to Firepower, Inc., Hancock, Me.
Filed Dec. 1, 1980, Ser. No. 211,583
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

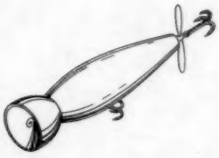
268,862
COMBINED DUCK DECOY AND STABILIZERS
Chris Fulster, 2810 3rd Ave., Sacramento, Calif. 95818
Filed Sep. 2, 1982, Ser. No. 414,083
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—21



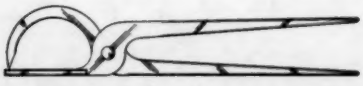
268,863
DUCK DECOY WITH STABILIZING ELEMENTS
Chris Fulster, 2810 3rd Ave., Sacramento, Calif. 95818
Filed Sep. 27, 1982, Ser. No. 424,201
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—21



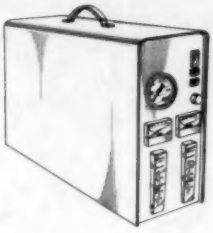
268,864
FISH LURE
Dennie M. Rivette, Jr., P.O. Box 855, Coeur d'Alene, Id. 83814
Filed Oct. 31, 1980, Ser. No. 202,793
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



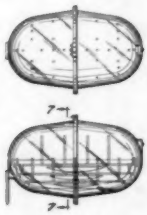
268,865
FISH HOLDING TOOL
Zane L. Zimmerman, 3221 Wayne, Granite City, Ill. 62042
Filed Sep. 25, 1980, Ser. No. 190,842
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31



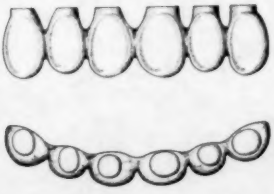
268,866
REVERSE OSMOSIS WATER PURIFIER
Satish V. Desai, and Mayadevi Desai, both of 4535 Woodley Ave., Encino, Calif. 91436
Filed Jul. 28, 1980, Ser. No. 173,150
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



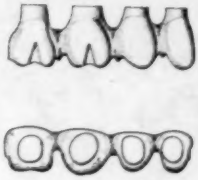
268,867
AUTOCLAVE CONTAINER
Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Whelchel, Newport Beach, Calif., assignors to Roger S. Sanderson, Dana Point, Calif.
Filed Jun. 3, 1980, Ser. No. 156,252
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9



268,868
DENTAL ANTERIOR PONTIC
Maurice Toff, 5546 W. Oakland Park Blvd., Fort Lauderdale, Fla. 33313
Filed Aug. 8, 1980, Ser. No. 176,464
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—66



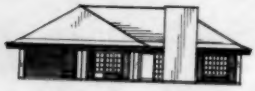
268,869
DENTAL POSTERIOR PONTIC
Maurice Toff, 5546 W. Oakland Park Blvd., Ft. Lauderdale, Fla. 33313
Filed Aug. 8, 1980, Ser. No. 176,646
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—10



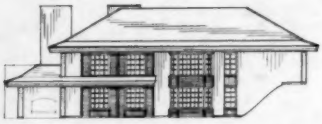
268,870
ORTHOPEDIC FIXATION CANULA
Charles L. Dohogne, 29615 Enrose Ave., San Pedro, Calif. 90732
Filed Oct. 14, 1980, Ser. No. 196,692
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

268,871
MEDICAL TUBING HUB FOR CATHETERS OR THE LIKE
Thomas H. Benham, Lake Jackson; James A. Martinsen, Clute, and Lorne C. Scharnberg, Lake Jackson, all of Tex., assignors to Alva Medical, Inc., St. Louis, Mo.
Filed Sep. 18, 1900, Ser. No. 185,782
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D24—53

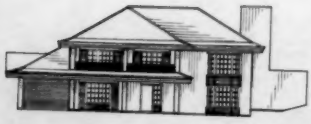
268,872
HOUSE
Uno T. Sundström, Valhallavägen 174, Stockholm 10253, and Sören B. D. Berg, Hallekullevägen 6, Hovas 43080, both of Sweden
Filed Aug. 8, 1980, Ser. No. 176,581
Claims priority, application Sweden, Feb. 11, 1980, 80-0292
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17



268,873
HOUSE
Uno T. Sundström, Valhallavägen 174, 10253 Stockholm, and Sören B. D. Berg, Hallekullevägen 6, 43080 Hovas, both of Sweden
Filed Aug. 8, 1980, Ser. No. 176,582
Claims priority, application Sweden, Feb. 11, 1980, 80-0293
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17

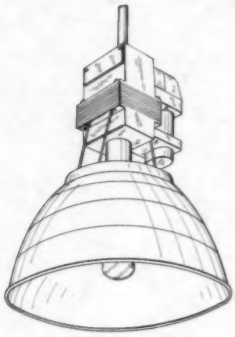


268,874
HOUSE
Uno T. Sundström, Valhallavägen 174, 10253 Stockholm, and Sören B. D. Berg, Hallekullevägen 6, 43080 Hovas, both of Sweden
Filed Aug. 8, 1980, Ser. No. 176,583
Claims priority, application Sweden, Feb. 11, 1980, 80-0294
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17



268,875
SHUTTER SLAT
Henry G. Kohler, 1022 Morena Blvd., San Diego, Calif. 92110
Continuation-in-part of Ser. No. 19,843, Mar. 12, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,122
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—47

268,876
HIGH INTENSITY LIGHT FIXTURE
Donald J. Leithauser, Jr., Westwood, N.J., assignor to Keene Corporation, Union, N.J.
Filed Mar. 25, 1981, Ser. No. 247,344
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—72



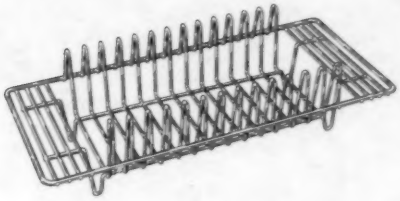
268,877
HAIR SPRAY SHIELD
Michael M. Loewenstine, Cincinnati, Ohio, assignor to Spray Shield, Inc., Cincinnati, Ohio
Filed Mar. 22, 1982, Ser. No. 360,176
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—9

268,878

**OVER-SINK DISH DRAINER**

William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jun. 4, 1981, Ser. No. 270,250
Term of patent 14 years
Int. Cl. D7—05
U.S. Cl. D32—55



# LIST OF PATENTEES

## TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Lawrence, Robert H., Jr.; and Hill, Phillip E., 4,381,624, Cl. 47-58.000.

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Aisin Seiki Kabushiki Kaisha: *See*—
Matsumoto, Hideo; Takahashi, Minoru; and Kato, Marehito, 4,381,910, Cl. 425-398.000.

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Noomen, Arie, 4,382,102, Cl. 427-54.100.

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Beigay, Jack M.; and Lula, Remus A., 4,381,660, Cl. 72-342.000.

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Alway, Vern J.: *See*—
Horner, George W.; and Alway, Vern J., 4,382,217, Cl. 318-778.000.

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Shepherd, Robert G., 4,382,143, Cl. 549-68.000.

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Kondo, Hideya; Yokoyama, Youichi; Aoyama, Yosiichi; and Mori, Tamotsu, 4,382,240, Cl. 335-8.000.

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Ishii, Mineo; and Arimoto, Kosei, 4,381,793, Cl. 134-60.000.

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Herweh, John E.; Garrett, Thomas B.; and Magnusson, Alan B., 4,382,134, Cl. 526-268.000.

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Yamaguchi, Etsuji; and Hotta, Hideo, 4,381,727, Cl. 118-408.000.

Arthur, Hugh M., to Molins Limited. Filter rod manufacture. 4,381,730, Cl. 118-674.000.

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Yamamoto, Shinichi; Asano, Mitsuru; Suzuki, Zituo; and Ito, Toshihiko, 4,381,912, Cl. 425-461.000.

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Ayerst, McKenna & Harrison, Inc.: *See*—
Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,382,088, Cl. 424-256.000.
Baba, Fumio: *See*—
Nakano, Masao; Baba, Fumio; and Mochizuki, Hirohiko, 4,382,194, Cl. 307-264.000.
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Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,382,088, Cl. 424-256.000.
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Baldwin Piano & Organ Company: *See*—
Conklin, Harold A., Jr.; and van Nuis, Pieter W., 4,381,691, Cl. 84-440.000.
Kimble, Thomas E., 4,381,690, Cl. 84-422.00R.
Ballestrazzi, Aris; and Tassi, Lamberto, to SITMA - Societa Italiana Macchine Automatiche S.p.A. Device for correctly positioning the film relative to the articles to be wrapped in a packaging machine. 4,381,637, Cl. 53-51.000.
Ballschuh, Detlef; Ohme, Roland; Rusche, Jochen; Seibt, Horst; Geneis, Kristina; and Schaurich, Kurt, to Akademie der Wissenschaften der DDR. Process for the manufacture of sulfobetaines. 4,381,980, Cl. 204-158.00R.
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Head, Robert E.; and Banerjee, Debashis, 4,381,902, Cl. 416-134.00A.
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Banucci, Eugene G.: *See*—
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Barmag Barmer Maschinenfabrik AG: *See*—
Haussler, Hubert, 4,381,699, Cl. 91-433.000.
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BASF Wyandotte Corporation: *See*—
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Berry, Samuel C.: *See*—
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Olivenbaum, James E.; and Bickley, Robert H., 4,382,227, Cl. 324-115.000.

Bilco Tools, Inc.: *See*—
Coyle, William E., Sr., 4,381,584, Cl. 24-263.00D.

Binsack, Rudolf; Kohler, Karl-Heinz; Morbitzer, Leo; Bottenbruch, Ludwig; and Heitz, Walter, to Bayer Aktiengesellschaft. Thermoplastic block copolyesters, a process for their production and their use for the production of mouldings. 4,382,131, Cl. 525-445.000.

Bion Corporation: *See*—
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,381,675, Cl. 73-620.000.

Biondetti, Mario, to Eacher Wyss Limited. Controlled deflection roll. 4,381,588, Cl. 29-116.0AD.

Biovation, Inc.: *See*—
Hughes, Leonard A.; Flavell, Evan R.; and Willman, Benjamin C., 4,381,895, Cl. 356-134.000.

Bird Machine Company, Inc.: *See*—
Conant, Lawrence D., 4,381,849, Cl. 494-43.000.

Bischlipp, Klaus; Pfeiffer, Jurgen; and Kannert, Paul, to Eduard Hueck KG. Apparatus for manufacturing insulating construction profiles. 4,381,907, Cl. 425-110.000.

Bjareklint, Ake: *See*—
Schwartz, Stephan; Ramstrom, Olle; and Bjareklint, Ake, 4,382,113, Cl. 428-408.000.

Black, David H. A.: *See*—
Joyce, Robert H.; Black, David H. A.; and Plangger, Franz O., 4,382,296, Cl. 370-81.000.

Black, William L., to United States of America, Navy. Ball-actuated tubular projectile. 4,381,712, Cl. 102-503.000.

Blackmore, Donald F.; and Halmosi, Rudolph, to General Motors Corporation. Steering mechanism for articulated vehicles. 4,381,827, Cl. 180-139.000.

Blaney, David H.: *See*—
Pinter, Warren H.; and Blaney, David H., 4,381,960, Cl. 156-175.000.

Blank, Heinz U.: *See*—
Goldschmitt, Ernst; Schnegg, Peter; and Blank, Heinz U., 4,382,039, Cl. 260-505.00R.

Bleemers, Michael A.: *See*—
Erichsen, Charles W.; and Bleemers, Michael A., 4,381,768, Cl. 128-80.00C.

Bloore, Frederick W.: *See*—
Seaman, Peter H.; and Bloore, Frederick W., 4,382,024, Cl. 252-511.000.

Blount, David H. Process for the production of polyhydroxy lignin-cellulose silicate polymer. 4,382,136, Cl. 527-305.000.

Blum, Pierre; and Devillard, Jacques, to Commissariat a l'Energie Atomique. Process for the production of titanium-based alloy members by powder metallurgy. 4,381,942, Cl. 419-23.000.

Boeing Company, The: *See*—
Feiertag, Frederick J.; and McLellan, Dale L., 4,381,666, Cl. 73-87.000.
Giles, Harry L., Jr., 4,381,642, Cl. 60-204.000.
Olbrechts, Guy R., 4,382,234, Cl. 331-10.000.

Boelcke, Ingo: *See*—
Arbeletche, Carlos; Boelcke, Ingo; Poehlmann, Peter; and Kirchner, Klaus, 4,381,897, Cl. 406-93.000.

Bogri, Tibor: *See*—
Palameta, Bozidar; Bogri, Tibor; and Bagli, Jehan, 4,382,088, Cl. 424-256.000.

Boland, Leona G.: *See*—
Sciaraffa, Michael A.; and Boland, Leona G., 4,381,781, Cl. 604-372.000.

Boldebuck, Edith M.; and Banucci, Eugene G., to General Electric Company. Preparation of aqueous coating composition comprising polyimide-forming reactants. 4,382,126, Cl. 524-376.000.

Bolin, Hubert; Bacus, James N.; and Barhaug, Ronald O., to Swift & Company. Sausage emulsions containing gluconate salts and process of preparation. 4,382,098, Cl. 426-646.000.

Bondy, Ferdinand H. Lid seal for nuclear waste containers. 4,381,844, Cl. 220-378.000.

Boogaart, Joseph D. Support system for potted plants. 4,381,838, Cl. 211-71.000.

Boomgaard, Dirk J.: *See*—
Ferree, Herbert E.; and Boomgaard, Dirk J., 4,381,852, Cl. 242-7.130.

Booth, John F., to Hepworth Iron Company Limited of Sheffield, The. Method for firing ceramic products. 4,382,051, Cl. 264-57.000.

Borden, Inc.: *See*—
Krueger, Bruno O., 4,382,149, Cl. 568-473.000.

Boreland, William; Dossor, John M.; and Jaques, Geoffrey S., to Imperial Chemical Industries Limited. Corrosion inhibitors and compositions containing them. 4,382,008, Cl. 252-75.000.

Borg Textile Corporation: *See*—
Abler, Norman C., 4,381,586, Cl. 26-2.00E.

Borin, Frank W.; and Thomas, Jeffrey G. Lock for a test station apparatus. 4,382,155, Cl. 174-38.000.

Borror, Alan L.; and Ellis, Ernest W., to Polaroid Corporation. Novel photographic products and processes. 4,382,119, Cl. 430-212.000.

Bottenbruch, Ludwig: *See*—
Binsack, Rudolf; Kohler, Karl-Heinz; Morbitzer, Leo; Bottenbruch, Ludwig; and Heitz, Walter, 4,382,131, Cl. 525-445.000.
Rudolph, Udo; Schmidt, Manfred; Freitag, Dieter; and Bottenbruch, Ludwig, 4,382,041, Cl. 260-544.00D.

Boucher, Terry D.; Hlavinka, Dennis J.; Kenshalo, Richard M.; and Johnson, Steven H., to Cobe Laboratories, Inc. Automatic ultrafiltration control system. 4,381,999, Cl. 210-637.000.

Bow, William J.: *See*—
Brigida, Carlo J.; and Bow, William J., 4,381,817, Cl. 165-110.000.

Bowditch, Robert S. Blow actuated microphone. 4,382,159, Cl. 179-1.0HF.

Boye, David W.; and Crockett, Neil M., to United Technologies Corporation. Vibrator for removing particulate material from the cavity of an article. 4,381,577, Cl. 15-304.000.

Brand, Raymond J.: *See*—
Fowler, Donald W.; Brand, Raymond J.; and Clelford, Douglas H., 4,382,281, Cl. 364-424.000.

Braude, Irwin A., to Meloy Laboratories, Inc. Purification of human immune interferon. 4,382,027, Cl. 260-112.00R.

Braun Aktiengesellschaft: *See*—
Schreiber, Friedrich; and Kirchner, Horst, 4,381,603, Cl. 30-43.920.

Bremer, Clemens, to Rheinmetall GmbH. Recoil block or brake for a linear breech mechanism in an automatic fire arm. 4,381,694, Cl. 89-190.000.

Bricaud, Herve G. P. M.: *See*—
Villemont, Claude M.; Bricaud, Herve G. P. M.; and Hamaide, Pierre, 4,382,271, Cl. 361-386.000.

Bridgeport Metal Goods Mfg. Co., The: *See*—
Marshall, Francis G.; and Moore, Ralph F., 4,382,220, Cl. 320-2.000.

Brigida, Carlo J.; and Bow, William J., to Foster Wheeler Energy Corporation. Wet/dry steam condenser. 4,381,817, Cl. 165-110.000.

Bromley, Eric; and Helmer, Thomas, to Coleco Industries, Inc. Electronic baseball game method and apparatus. 4,381,864, Cl. 273-88.000.

Brooks, Marvin Q. Pipe joint make-up and break-out tool. 4,381,685, Cl. 81-57.200.

Brother Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Toshikatu; Goto, Kihei; Ichihashi, Yasuro; and Kawase, Takenori, 4,381,722, Cl. 112-235.000.

Brown, Charles W. Combination potty seat and step stool. 4,381,568, Cl. 4-239.000.

Brown, Peter W.; DuBois, Chester G.; and McChesney, Richard M., to Outboard Marine Corporation. Carburetor for internal combustion engine. 4,382,047, Cl. 261-41.00D.

Brownawell, Darrell W.: *See*—
Walker, Thad O.; Brownawell, Darrell W.; and Gutierrez, Antonio, 4,382,002, Cl. 252-8.50C.

Bruner, Harry E. Guide bar for cutting torch. 4,381,854, Cl. 266-54.000.

Brunner, Alfred, to Sulzer Brothers Limited. Cradle system for a steam generator. 4,381,735, Cl. 122-510.000.

Brunner, Alfred, to Sulzer Brothers Limited. Thermal insulation for pipes and method for fabricating the same. 4,381,801, Cl. 138-148.000.

Brunswick Corporation: *See*—
Kusche, David W., 4,381,644, Cl. 60-313.000.

Brunton Company, The: *See*—
Kramer, Melvin G., 4,381,610, Cl. 33-312.000.

Bruso, Loran H.: *See*—
Romito, Vincent A.; and Bruso, Loran H., 4,382,063, Cl. 422-57.000.

Buchbinder, Emanuel, to Makhteshim Chemical Works Ltd. Pesticide fogging compositions and solvent therefor. 4,382,077, Cl. 424-40.000.

Buffalo Forge Company: *See*—
Geitner, Lawrence J., 4,381,632, Cl. 52-262.000.

Buhrer, Carl F., to GTE Laboratories Incorporated. Ballast circuit for direct current arc lamp. 4,382,210, Cl. 315-073.000.

Burkel, Rainer: *See*—
Eckert, Konrad; Muller, Klaus; Linder, Ernst; Maurer, Helmut; Rieger, Franz; Moser, Winfried; Franke, Horst; Burkel, Rainer; and Peter, Cornelius, 4,381,748, Cl. 123-414.000.

Burley, David R.: *See*—
Rickelton, William A.; Robertson, Allan J.; and Burley, David R., 4,382,016, Cl. 252-428.000.

Burton, Thomas A., to Waters Instruments, Inc. Ileostomy valve. 4,381,765, Cl. 128-1.00R.

Busch, Francis W., Jr.; Pallone, Thomas J.; Berube, Gene R.; Vyas, Ambrish H.; Faryniarz, Joseph R.; and Russo, John A., to Chesebrough-Pond's Inc. Compositions, articles and methods for polishing surfaces. 4,381,792, Cl. 132-75.600.

Byrd, Carlisle O., Jr.: *See*—
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., 4,381,634, Cl. 52-506.000.

Byrne, Martin A.: *See*—
Ellison, Robert H.; and Byrne, Martin A., 4,382,130, Cl. 525-337.000.

C. A. Weidmuller GmbH & Co.: *See*—
Wiener, Hans; and Undin, Hans, 4,381,661, Cl. 72-409.000.

Cady, John M.; and Egan, William E., to Goodyear Tire & Rubber Company, The. Tire with dual tread compound. 4,381,810, Cl. 152-209.00R.

Cameron Iron Works, Inc.: *See*—
Croy, David G.; Hollingsworth, Lee M.; Williams, Leonard E., Jr.; Jolly, Richard D.; and Tate, Mark C., 4,381,868, Cl. 277-27.000.

**Canon Denshi Kabushiki Kaisha:** *See*—
Kato, Minoru, 4,382,269, Cl. 360-121.000.
**Canon Kabushiki Kaisha:** *See*—
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Moniyama, Kikuo, 4,381,888, Cl. 350-458.000.
Someya, Hiromi, 4,381,892, Cl. 354-287.000.
Caracciolo, Frank, to General Motors Corporation. Protecting catalyst from phosphorus poisoning. 4,381,755, Cl. 123-573.000.
**Cardiac Imaging Limited Partnership:** *See*—
Wernikoff, Robert E., 4,382,184, Cl. 378-37.000.
**Carl Schenck AG:** *See*—
Schneider, Hatto G. A., 4,381,670, Cl. 73-471.000.
**Carr, John F.:** *See*—
Flanders, James R.; Halford, David W.; and Carr, John F., 4,381,573, Cl. 12-12.000.
**Carrier Corporation:** *See*—
Mount, Gordon L., 4,381,650, Cl. 62-157.000.
Tobin, Curtis L.; and Ciarlei, Joseph A., 4,381,798, Cl. 137-625.430.
Carroll, Woodrow; and McClellan, Thomas R., to Upjohn Company, The. Novel compositions and process. 4,382,108, Cl. 428-326.000.
Carver, George P.; Heap, Michael P.; Martin, G. Blair; Pershing, David W.; Rees, Dee P.; and Zallen, Dennis M. Low emissions process and burner. 4,381,718, Cl. 110-347.000.
**Casale, Thomas M.:** *See*—
Power, John B.; Casale, Thomas M.; and Pauperas, Victor, 4,381,795, Cl. 137-240.000.
**Case, Robert F.:** *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., 4,381,705, Cl. 101-69.000.
**Casio Computer Co., Ltd.:** *See*—
Fujisawa, Hidetaka, 4,382,251, Cl. 340-384.00E.
Castillo, Carmen; and Hayes, John C., to UOP Inc. Passivation of metal contaminants on cracking catalyst. 4,382,015, Cl. 252-417.000.
**Caterpillar Tractor Co.:** *See*—
Ruseff, Walter Z.; and Schimpf, James E., 4,381,646, Cl. 60-452.000.
Ruseff, Walter Z., 4,381,647, Cl. 60-452.000.
Cavazza, Claudio, to Sigma-TAU Industrie Farmaceutiche Riunite S.p.A. Pharmaceutical composition comprising gamma-butyrobetaine for the treatment of syndromes induced by L-carnitine deficiency. 4,382,092, Cl. 424-316.000.
**Central Glass Company, Limited:** *See*—
Otsuka, Toyozo; Kitsugi, Naomichi; and Fujinaga, Teruo, 4,382,071, Cl. 423-341.000.
**Centronics Data Computer Corporation:** *See*—
Shiurila, John, 4,381,896, Cl. 400-56.000.
**Ceramic Cooling Tower Company:** *See*—
Frohwerk, Paul A., 4,382,046, Cl. 261-94.000.
Chafetz, Harry; Love, Richard F.; and Waldbillig, James O., to Texaco Inc. Novel dispersant-VI improvers and lubricating oil containing same. 4,382,007, Cl. 252-51.50A.
Chakravarti, Kalidas; and Lazarus, Stanley D., to Allied Corporation. Process for the production of reinforced rubber articles. 4,381,640, Cl. 57-242.000.
**Chen, Bill C. J.:** *See*—
United States of America, National Aeronautics and Space Administration; Chen, Bill C. J.; and Hartop, Robert W., 4,382,239, Cl. 333-248.000.
**Chesebrough-Pond's Inc.:** *See*—
Busch, Francis W., Jr.; Pallone, Thomas J.; Berube, Gene R.; Vyas, Ambrish H.; Faryniarz, Joseph R.; and Russo, John A., 4,381,792, Cl. 132-75.600.
**Chevron Research Company:** *See*—
Kuehler, Christopher W., 4,381,987, Cl. 208-10.000.
Mulaskey, Bernard F., 4,382,023, Cl. 252-455.00Z.
Cho, Hideyuki. Apparatus for correcting deviation of travelling fabrics. 4,381,587, Cl. 26-78.000.
**Ciarlei, Joseph A.:** *See*—
Tobin, Curtis L.; and Ciarlei, Joseph A., 4,381,798, Cl. 137-625.430.
Cichonski, Walter E., to Stephen Laurie Manufacturing Company, Inc. Narrow profile jamb window. 4,381,627, Cl. 49-453.000.
**Citizen Watch Co., Ltd.:** *See*—
Takasugi, Tsuneji; and Umezawa, Seiji, 4,382,172, Cl. 219-137.00R.
Claflin, H. Bruce. Multi-purpose zone controlled blast furnace and method of producing hot metal, gases and slags. 4,381,938, Cl. 75-42.000.
**Clairol Incorporated:** *See*—
Barns, Ileana D., 4,382,174, Cl. 219-370.000.
Springer, William E.; and Kurtz, Stewart K., 4,381,790, Cl. 132-37.00R.
Clark, Raymond P.; and Hunt, William V., to Watkins and Watson Limited. Methods of and apparatus for the detection of airborne particles. 4,381,664, Cl. 73-40.700.
Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, to Compagnie Francaise de Raffinage. Process for the preparation of suspensions of polymers; suspensions of said polymers; and uses of said suspensions. 4,382,127, Cl. 524-504.000.
Clawson, Arthur H., Jr.: *See*—
Tribby, Charles T.; Clawson, Arthur H., Jr.; and Clawson, Charles D., 4,382,203, Cl. 310-355.000.
Clawson, Charles D.: *See*—
Tribby, Charles T.; Clawson, Arthur H., Jr.; and Clawson, Charles D., 4,382,203, Cl. 310-355.000.
Clelford, Douglas H.; and Murphy, Richard D., to United Technologies Corporation. Helicopter attitude and airspeed acquisition and retention system. 4,382,283, Cl. 364-434.000.
**Clelford, Douglas H.:** *See*—
Fowler, Donald W.; Brand, Raymond J.; and Clelford, Douglas H., 4,382,281, Cl. 364-424.000.
**Cleven, Russell W.:** *See*—
Patz, Paul; Patz, Howard G.; Cleven, Russell W.; and Hackbarth, James M., 4,381,733, Cl. 119-52.00B.
Patz, Paul; Patz, Howard G.; Cleven, Russell W.; and Hackbarth, James M., 4,381,734, Cl. 119-52.00B.
**Cobe Laboratories, Inc.:** *See*—
Boucher, Terry D.; Hlavinka, Dennis J.; Kenshalo, Richard M.; and Johnson, Steven H., 4,381,999, Cl. 210-637.000.
**Coleco Industries, Inc.:** *See*—
Bromley, Eric; and Helmer, Thomas, 4,381,864, Cl. 273-88.000.
**Colgate/Palmolive:** *See*—
Marschner, Frank W., 4,382,079, Cl. 424-65.000.
Colleselli, Karl, to Tyrolit-Schleifmittelwerke Swarovski KG. Grinding disk. 4,381,925, Cl. 51-298.000.
Colvin, Jack A.; Hellmann, John V.; and Smock, Alan L., to General Motors Corporation. Solenoid operated electrical switch. 4,382,242, Cl. 335-202.000.
**Commissariat a l'Energie Atomique:** *See*—
Blum, Pierre; and Devillard, Jacques, 4,381,942, Cl. 419-23.000.
**Comolli, Alfred G.:** *See*—
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**Compagnie Europeenne pour l'Equipment Menager "CEPEM":** *See*—
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**Compagnie Francaise de Raffinage:** *See*—
Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, 4,382,127, Cl. 524-504.000.
**Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme):** *See*—
Ugon, Michel, 4,382,279, Cl. 364-200.000.
Conant, Lawrence D., to Bird Machine Company, Inc. Solids-liquid slurry separating centrifuge. 4,381,849, Cl. 494-43.000.
**Conax Corporation:** *See*—
Miller, Francis M., 4,382,231, Cl. 324-439.000.
Conklin, Harold A., Jr.; and van Nuis, Pieter W., to Baldwin Piano & Organ Company. Touch force adjustment means for a piano. 4,381,691, Cl. 84-440.000.
**Connell, Richard B.:** *See*—
Kucera, Clare H.; and Connell, Richard B., 4,382,003, Cl. 252-8.55R.
**Container Corporation of America:** *See*—
Cortopassi, Jeff J., 4,381,837, Cl. 206-485.000.
**Continental Packaging Company, Inc.:** *See*—
Walter, John, 4,381,959, Cl. 156-69.000.
**Contour Packaging Corporation:** *See*—
Schwarz, Howard H., 4,381,841, Cl. 220-23.400.
**Cook, Neal A.:** *See*—
Granetzke, Dennis C.; and Cook, Neal A., 4,381,816, Cl. 165-40.000.
Cook, William C., to Lockheed Corporation. Programmed oleo-pneumatic shock absorber. 4,381,857, Cl. 267-64.150.
Coonrod, William C., to Fibergrate Corporation. Continuous process and apparatus for fabricating fiber reinforced plastic grating articles. 4,382,056, Cl. 264-137.000.
**Cooper Industries, Inc.:** *See*—
Ford, James A.; and Haarer, Steven R., 4,381,812, Cl. 160-172.000.
Cope, Geoffrey W., to Dresser Industries, Inc. Method of manufacturing a resilient side bearing. 4,381,589, Cl. 29-149.50R.
Coquin, Jean-Claude. Device for holding accessories for the lenses of apparatuses for taking pictures. 4,381,885, Cl. 350-318.000.
**Cordemans, Luc:** *See*—
Laurer, Peter R.; Krome, Gerd; Cordemans, Luc; Seifert, Reinhard; and Danz, Eckehard, 4,382,021, Cl. 252-441.000.
**Cornet, Michel:** *See*—
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**Corning Glass Works:** *See*—
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., 4,381,815, Cl. 165-10.000.
Olson, John H.; and Schlaufman, Robert J., 4,381,932, Cl. 65-66.000.
Cortner, Joseph M., to Sperry Corporation. N Indicator-switches connected for one of N selection by N wires. 4,382,257, Cl. 340-825.870.
Cortopassi, Jeff J., to Container Corporation of America. Protective tray. 4,381,837, Cl. 206-485.000.
Cottrell, Peter E.; and Troutman, Ronald R., to International Business Machines Corporation. Channel hot electron monitor. 4,382,229, Cl. 324-158.00T.
**Council, Malcolm N.:** *See*—
Kyte, Louis D.; and Council, Malcolm N., 4,381,904, Cl. 417-287.000.
Courtis, Thomas M.; and Donelson, Carl E., to Red Lodge Manufacturing Co. Automatic gate assembly. 4,381,626, Cl. 49-385.000.
**Cox, Josephine M.:** *See*—
Goudie, Alexander C.; and Cox, Josephine M., 4,382,094, Cl. 424-330.000.
Coyle, William E., Sr., to Bilco Tools, Inc. Dual string spider. 4,381,584, Cl. 24-263.00D.
**Crafon Medical AB:** *See*—
Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Ove G., 4,382,246, Cl. 338-26.1HR.

Craig, Laurence B.; and Farina, Alfred J. Combustion heating system. 4,381,913, Cl. 431-264.000.
Craig, Laurence B.; and Farina, Alfred J. Thermocatalytic reactor and process for producing same. 4,381,970, Cl. 162-152.000.
Crimmins, Darrell B.; and Steinmetz, George H., to Frito-Lay, Inc. Vertical soak tank with improved levelling and weighing apparatus. 4,381,703, Cl. 99-516.000.
Cripe, Christopher A., to Bi-Modal Corporation. Convertible rail-highway semi-trailer air controlled braking and suspension shifting system. 4,381,713, Cl. 105-215.00C.
Crocker, Alfred J. Reciprocating engine. 4,381,740, Cl. 123-58.0AA.
Crockett, Neil M.: *See*—
Boye, David W.; and Crockett, Neil M., 4,381,577, Cl. 15-304.000.
Crompton & Knowles Corporation: *See*—
Grigas, Daniel P., 4,381,806, Cl. 139-450.000.
Cronin, Michael J., to Lockheed Corporation. Dual-range drive configurations for synchronous and induction generators. 4,382,188, Cl. 290-1.00C.
Crothers, William G., to Deer Park Baking Co. Apparatus to make cookies. 4,381,697, Cl. 99-353.000.
Croy, David G.; Hollingsworth, Lee M.; Williams, Leonard E., Jr.; Jolly, Richard D.; and Tate, Mark C., to Cameron Iron Works, Inc. Pressure-actuated wellhead sealing assembly. 4,381,868, Cl. 277-27.000.
Cubic Western Data: *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., 4,381,705, Cl. 101-69.000.
Cummins Engine Company, Inc.: *See*—
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Curtis, Kenneth R.: *See*—
Betts, Joseph E.; Vostovich, Joseph E.; and Curtis, Kenneth R., 4,382,112, Cl. 428-379.000.
Daenen, Theo E. G.; van Dijk, Gerardus A. R.; and Stolk, Steven A., to U.S. Philips Corporation. Aluminium electroplating solution. 4,381,975, Cl. 204-14.00N.
Daicel Chemical Industries, Ltd.: *See*—
Takahashi, Shigeyuki, 4,382,115, Cl. 428-424.600.
Daiichi Seiyaku Co., Ltd.: *See*—
Shiba, Tetsuo; Yamamura, Yuichi; Kotani, Shozo; Nagase, Osamu; and Ogawa, Hidemasa, 4,382,080, Cl. 424-177.000.
Dakota Plastics Company: *See*—
Koistinen, Arnold A., 4,381,623, Cl. 47-48.500.
Danfoss A/S: *See*—
Petersen, Hans C., 4,381,905, Cl. 418-61.00B.
Danz, Eckehard: *See*—
Laurer, Peter R.; Krome, Gerd; Cordemans, Luc; Seifert, Reinhard; and Danz, Eckehard, 4,382,021, Cl. 252-441.000.
Dart Industries, Inc.: *See*—
Allan, John L. H.; Patnaik, Birendra K.; and Agapiou, Agapios, 4,382,018, Cl. 252-429.00B.
Gaylord, Norman G., 4,382,133, Cl. 526-204.000.
Daugherty, James B.: *See*—
Balash, Frederick A.; and Daugherty, James B., 4,382,165, Cl. 200-5.00A.
Davidson, Ronnie D.; and Preston, Bruce S., to Westinghouse Electric Corp. Ground fault circuit breaker with mechanical indicator for ground fault trips. 4,382,270, Cl. 361-115.000.
Dayco Corporation: *See*—
Power, John B.; Casale, Thomas M.; and Pauperas, Victor, 4,381,795, Cl. 137-240.000.
De Backer, Jean A.; and Yperman, Jacques L., to Societe Anonyme des Etablissements Adrien De Backer. Flush runway inset top assembly for airport guidance light apparatus and guidance light apparatus comprising a top assembly of this type. 4,382,274, Cl. 362-153.000.
De Ceuster, Jean; and Duprez, Paul, to Interox. Process for the regeneration of waste paper. 4,381,969, Cl. 162-5.000.
Deckman, Harry W.: *See*—
Goldstein, Irving S.; Kalk, Franklin D.; and Deckman, Harry W., 4,381,963, Cl. 156-245.000.
de Cubas, Luis A.: *See*—
de Cubas, Mercedes Z.; and de Cubas, Luis A., 4,381,865, Cl. 273-294.000.
de Cubas, Mercedes Z.; and de Cubas, Luis A. Geometric domino-type game. 4,381,865, Cl. 273-294.000.
Deer Park Baking Co.: *See*—
Crothers, William G., 4,381,697, Cl. 99-353.000.
Deere & Company: *See*—
Eagles, Derek M., 4,381,995, Cl. 210-137.000.
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Elias, Robert T., to Johnson & Johnson. Absorbent article. 4,381,783, Cl. 604-368.000.

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Engler, Edgar D.; and Lorenz, Gary V., to Riggers Manufacturing Co. Gantry having adjustable side supports. 4,381,839, Cl. 212-208.000.

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Ess, Wilfried, to Schelling & Co. Apparatus for cutting and conveying planar workpieces. 4,381,686, Cl. 83-104.000.

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Feis, Mark J. Dispenser for shotgun shells. 4,381,845, Cl. 221-185.000.

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Ferguson, Glen E. Candlewick. 4,381,914, Cl. 431-267.000.

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Finney, Roy P., to Medical Engineering Corporation. Penile implant. 4,381,767, Cl. 128-79.000.

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Forman, David M. Adjustable shelf mounting system. 4,381,715, Cl. 108-152.000.
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Foster Wheeler Energy Corporation: *See*—
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Foxen, Benjamin F. Ash removing apparatus. 4,381,761, Cl. 126-243.000.
Fraleux, Jean; and Ploix, Jean L., to Thomson-CSF. Electromagnetic radiation detection matrix. 4,382,187, Cl. 250-578.000.
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Frey, Yvan A. R.; and De Haan, Andre P. Z. Combustion detecting device using metallo-phthalocynine semiconductor and process of preparing same. 4,381,922, Cl. 422-98.000.
Frick, Roger L.: *See*—
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Fries, Donald M.: *See*—
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Frimet, Stanley H., to Honeywell Inc. Tape transport speed control. 4,382,268, Cl. 360-73.000.
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Funk, Francis C., to Deere & Company. Engine coolant heater. 4,381,742, Cl. 123-142.50R.
Funk, Gary L., to Phillips Petroleum Company. Control of heat transfer from heat exchangers in parallel. 4,381,814, Cl. 165-1.000.
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Furzer, Ian A. Distillation columns. 4,381,974, Cl. 202-158.000.
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Gahn, Randall F.; Reid, Margaret A.; and Yang, Chiang Y., to United States of America, National Aeronautics and Space Administration. Zirconium carbide as an electrocatalyst for the chromous/chromic REDOX couple. 4,382,116, Cl. 429-34.000.
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Garlen, David, to Michael-David Laboratories. Method and composition for dyeing human hair. 4,381,920, Cl. 8-406.000.
Garner, Robert H.: *See*—
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Garrett, Thomas B.: *See*—
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Holstein, Siegbert, to Dr. Johannes Heidenhain GmbH. Length measuring instrument. 4,381,609, Cl. 33-125.00C.
Holtz, Maurice; and Singh, Krishna P., to Joseph Oat Corporation. Radioactive fuel cell storage rack. 4,382,060, Cl. 376-272.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kudo, Satoru; Ohkubo, Kiyokazu; and Nakayama, Hiroshi, 4,381,682, Cl. 74-476.000.
Yuzawa, Teruo; and Uchida, Masaaki, 4,381,753, Cl. 123-520.000.
Honeywell Inc.: *See*—
Dressel, Lawrence J.; Wruck, Richard A.; and Westphal, Bruce D., 4,382,284, Cl. 364-492.000.
Frimet, Stanley H., 4,382,268, Cl. 360-73.000.
Honeywell Information Systems Inc.: *See*—
Henneberg, Helmut H.; Arabian, Ralph H.; and Grant, Howard A., 4,381,714, Cl. 108-147.000.
Jacobsthal, Herbert K., 4,382,249, Cl. 340-347.0DD.
McIver, Chandler H., 4,381,602, Cl. 29-840.000.
Horiba Ltd.: *See*—
Kimura, Osamu, 4,382,183, Cl. 250-310.000.
Horn, Robert E.: *See*—
Freiberga, Elmer; Horn, Robert E.; and Jacobs, Harold, 4,382,261, Cl. 343-854.000.
Horner, George W.; and Alway, Vern J., to Gould Inc. Starting control circuit for an A.C. motor. 4,382,217, Cl. 318-778.000.
Horng, Cheng T.: *See*—
Ho, Allen P.; and Horng, Cheng T., 4,381,953, Cl. 148-1.500.
Horodysky, Andrew G., to Mobil Oil Corporation. Friction reduction additives and compositions thereof. 4,382,006, Cl. 252-49.600.
Horst, Milton C. Vibrating scraper. 4,381,604, Cl. 30-169.000.
Hotfoil Limited: *See*—
Seaman, Peter H.; and Bloore, Frederick W., 4,382,024, Cl. 252-511.000.
Hotta, Hideo: *See*—
Yamaguchi, Etsuji; and Hotta, Hideo, 4,381,727, Cl. 118-408.000.
Hotta, Masahiro: *See*—
Takagi, Toshinori; Nakata, Shinsaku; Kanki, Kazuhiko; and Hotta, Masahiro, 4,382,110, Cl. 428-336.000.
Hottinger, Charles F., to Technicare Corporation. Ultrasound imaging system combining static B-scan and real-time sector scanning capability. 4,381,787, Cl. 128-660.000.
Houle, Omer, to United States of America, Air Force. Adjustable holder for an optical element. 4,381,884, Cl. 350-287.000.
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., to Manville Service Corporation. Fiber blanket insulation module. 4,381,634, Cl. 52-506.000.
Howard-Leicester, Michael. System for automatically regulating water conductivity in an electrode-type humidifier evaporator. 4,382,173, Cl. 219-295.000.
Howard, William M., to Hercules Incorporated. Triaminoguanidine nitrate-containing propellants. 4,381,958, Cl. 149-19.800.
Howarth, Thomas T.: *See*—
Ponsford, Roger J.; and Howarth, Thomas T., 4,382,084, Cl. 424-114.000.
Howell, Danny T.: *See*—
Howell, William T., Jr.; Howell, Danny T.; and Howell, John T., 4,381,861, Cl. 272-65.000.
Howell, John T.: *See*—
Howell, William T., Jr.; Howell, Danny T.; and Howell, John T., 4,381,861, Cl. 272-65.000.
Howell, William T., Jr.; Howell, Danny T.; and Howell, John T. Octagonal trampoline. 4,381,861, Cl. 272-65.000.
Huggler, Peter E., to Toastmaster, Inc. Apparatus for controlling toast color in a toaster oven. 4,382,175, Cl. 219-413.000.
Hughes Helicopters, Inc.: *See*—
Head, Robert E.; and Banerjee, Debashis, 4,381,902, Cl. 416-134.00A.
Hughes, Leonard A.; Flavell, Evan R.; and Willman, Benjamin C., to Biovation, Inc. Method and apparatus for automatic flow-through digital refractometer. 4,381,895, Cl. 356-134.000.
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Johnson, Clyde V.; and Huijnen, Wilhelmus G. J., 4,381,873, Cl. 299-5.000.
Huininga, Theodore G. Poultry nest. 4,381,732, Cl. 119-45.00R.
Hukkanen, Pentti. Method for producing disposable targets for shooting sports and other similar purposes. 4,382,054, Cl. 264-123.000.
Hunkeler, Walter; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Diazepine derivatives. 4,382,032, Cl. 260-239.30P.
Hunold, Klaus; Reinmuth, Klaus; and Lipp, Alfred, to Elektroschmelzwerk Kempten GmbH. Process for the manufacture of substantially pore-free shaped polycrystalline articles by isostatic hot-pressing in glass casings. 4,381,931, Cl. 65-18.100.
Hunt, William V.: *See*—
Clark, Raymond P.; and Hunt, William V., 4,381,664, Cl. 73-40.700.
Hunter Douglas International N.V.: *See*—
Frentzel, Kurt H.; and Oskam, Herman, 4,381,811, Cl. 160-168.00R.
Hunter, William A.: *See*—
Barlow, Allan R.; and Hunter, William A., 4,382,215, Cl. 318-568.000.
Hurni, William M.; Miller, William M.; and McAleer, William J., to Merck & Co., Inc. Hepatitis A antibody assay. 4,382,076, Cl. 436-531.000.
Hutt, Marland P.: *See*—
Haskell, Theodore H.; and Hutt, Marland P., 4,382,089, Cl. 424-258.000.
Hydrocarbon Research, Inc.: *See*—
Antieri, Salvatore J.; and Comolli, Alfred G., 4,381,986, Cl. 208-8.00R.
Hyzak, Daniel L., to Stauffer Chemical Company. Herbicide compositions of extended soil life. 4,381,936, Cl. 71-100.000.
Ichihashi, Yasuro: *See*—
Takeuchi, Toshikatu; Goto, Kihei; Ichihashi, Yasuro; and Kawase, Takenori, 4,381,722, Cl. 112-235.000.
Ichikawa, Hiroshi: *See*—
Kuwayama, Hirotsugu; and Ichikawa, Hiroshi, 4,382,111, Cl. 428-375.000.
Idemitsu Kosan Company Limited: *See*—
Kuwayama, Hirotsugu; and Ichikawa, Hiroshi, 4,382,111, Cl. 428-375.000.
Igefjord, Magnus G. K.: *See*—
Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Ove G., 4,382,246, Cl. 338-26.1HR.
Iimura, Yoshitaka: *See*—
Yoshieda, Keiichi; and Iimura, Yoshitaka, 4,381,593, Cl. 29-408.000.
Imperial Chemical Industries Limited: *See*—
Boreland, William; Dossor, John M.; and Jaques, Geoffrey S., 4,382,008, Cl. 252-75.000.
Imperial Chemical Industries PLC: *See*—
Wem, James W., 4,382,045, Cl. 261-89.000.
Imperial Clevite Inc.: *See*—
Levande, George A.; and Schwarzenbart, Frederick J., 4,381,594, Cl. 29-508.000.
Inacker, Henry F.; and Henderson, Elmer L., to RCA Corporation. Temperature compensation of a flux drive gyromagnetic system. 4,382,237, Cl. 333-24.100.
Inai, Yuichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Ohgoh, Toshiharu; Murakami, Manabu; Oketani, Kiyoshi; and Fujisaki, Hideaki, 4,382,151, Cl. 568-875.000.
Industrial Machine Works, Inc.: *See*—
Ryan, John P., 4,381,855, Cl. 266-248.000.
Industrial Metal Fabricators Co.: *See*—
Stimac, John F.; and Goulet, Paul E., 4,381,794, Cl. 134-67.000.
Inficon Leybold-Heraeus, Inc.: *See*—
Gogol, Carl A., Jr.; and Prince, Eric T., 4,381,894, Cl. 356-72.000.
Ingraffea, Dominic D., to James River-Dixie/Northern, Inc. Apparatus for forming a paperboard container. 4,381,909, Cl. 425-387.100.
Ingram, J. Richard. Adjustable drain plug. 4,381,569, Cl. 4-295.000.
Inland Steel Company: *See*—
Lepp, Raymond J., 4,381,704, Cl. 100-35.000.
Innova, Inc.: *See*—
Ryder, George A., Jr., 4,381,985, Cl. 204-296.000.
Inoue, Akihiko; Inoue, Hirofumi; Nakamura, Tsuyoshi; Tobino, Seiji; and Baba, Masamitsu, to Nippon Steel Corporation. Method of repairing blast furnace wall lining. 4,381,856, Cl. 266-281.000.
Inoue, Hirofumi: *See*—
Inoue, Akihiko; Inoue, Hirofumi; Nakamura, Tsuyoshi; Tobino, Seiji; and Baba, Masamitsu, 4,381,856, Cl. 266-281.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,382,168, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Ultra-fine finish EDM method and apparatus. 4,382,168, Cl. 219-69.00M.
Intel Magnetics, Inc.: *See*—
Silverman, Peter J., 4,382,288, Cl. 365-8.000.
International Business Machines Corporation: *See*—
Cottrell, Peter E.; and Troutman, Ronald R., 4,382,229, Cl. 324-158.00T.
Ho, Allen P.; and Horng, Cheng T., 4,381,953, Cl. 148-1.500.
Mitchell, Joan L.; and Quarendon, Peter, 4,382,286, Cl. 364-900.000.
Sachar, Kenneth S.; and Silvestri, Victor J., 4,381,818, Cl. 165-133.000.
International Control Systems, Inc.: *See*—
Shifflet, Glenn W., 4,382,235, Cl. 331-127.000.
International Honeycomb Corporation: *See*—
Royster, William V., 4,382,106, Cl. 428-40.000.
International Telephone and Telegraph Corporation: *See*—
Ranghelli, Joseph C., 4,382,260, Cl. 343-730.000.

Interox: *See*—
De Ceuster, Jean; and Duprez, Paul, 4,381,969, Cl. 162-5.000.
IPOS Gesellschaft fur integrierte Prothesen-Entwicklung und orthopadietechnischen Service mbH & Co. KG: *See*—
Prahl, Jan, 4,381,769, Cl. 128-91.00R.
Isaacson, Milton S., to Nu-Tech Industries, Inc. Hydrodynamic bearing system for a brushless DC motor. 4,382,199, Cl. 310-87.000.
Ishiguro, Toru: *See*—
Watanabe, Juro; Ohnishi, Keizo; Ishiguro, Toru; and Ogawa, Takatoshi, 4,381,940, Cl. 75-124.000.
Ishii Hyoki Co., Ltd.: *See*—
Ishii, Mineo; and Arimoto, Kosei, 4,381,793, Cl. 134-60.000.
Ishii, Mineo; and Arimoto, Kosei, to Ishii Hyoki Co., Ltd. Printed circuit plate washing apparatus. 4,381,793, Cl. 134-60.000.
Ishijima, Yasumori; and Murooka, Rikichi, to Tektronix, Inc. Amplitude limiter circuit. 4,382,198, Cl. 307-555.000.
Itano, Mitsuyoshi: *See*—
Uehara, Masafumi; and Itano, Mitsuyoshi, 4,381,946, Cl. 106-22.000.
Ito, Naoya; Yoshida, Takeshi; Aoki, Masahiro; Okubo, Masao; and Miki, Masayoshi, to Sumitomo Chemical Company, Limited. Method for improving surface defect of specific steel resistant to concentrated nitric acid. 4,381,941, Cl. 75-130.500.
Ito, Ren: *See*—
Yokokura, Hisao; Kitamura, Teruo; Ito, Ren; Nakano, Fumio; Morishita, Hirosada; Sato, Mikio; and Kando, Yasuhiko, 4,381,886, Cl. 350-341.000.
Ito, Toshihiko: *See*—
Yamamoto, Shinichi; Asano, Mitsuru; Suzuki, Zituo; and Ito, Toshihiko, 4,381,912, Cl. 425-461.000.
Itoh, Hiroshi: *See*—
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Otsuki, Hiromi, 4,381,747, Cl. 123-339.000.
ITT Industries Inc.: *See*—
Andrei-Alexandru, Marcel; Ott, Klaus; and Prohaska, Hans, 4,381,625, Cl. 49-280.000.
ITW de France: *See*—
Morel, Henri, 4,381,585, Cl. 24-270.000.
Iwai, Kiyoshi; and Goto, Shinjiro, to Hitachi Shipbuilding and Engineering Company, Limited. Coal fired ship. 4,381,724, Cl. 114-65.00R.
Iwasaki, Sadayoshi: *See*—
Maruyama, Takeshige; and Iwasaki, Sadayoshi, 4,382,167, Cl. 200-153.00J.
Jacobs, Harold: *See*—
Freiberga, Elmer; Horn, Robert E.; and Jacobs, Harold, 4,382,261, Cl. 343-854.000.
Jacobs, Laurence N.: *See*—
Mezei, Louis M.; Jacobs, Laurence N.; and Berry, Samuel C., 4,382,122, Cl. 436-74.000.
Jacobson, J. Merritt. Wind motor having horizontally counter-rotating wind force collectors. 4,382,190, Cl. 290-55.000.
Jacobsthal, Herbert K., to Honeywell Information Systems Inc. Apparatus and method for decoding information. 4,382,249, Cl. 340-347.0DD.
Jacquet, Bernard; and Lang, Gerard, to Societe Anonyme dite: L'Oreal. Hair dye composition containing quaternized polymers. 4,381,919, Cl. 8-405.000.
Jaffe, Fred: *See*—
Hardy, Thomas A.; and Jaffe, Fred, 4,382,042, Cl. 260-980.000.
James River-Dixie/Northern, Inc.: *See*—
Ingraffea, Dominic D., 4,381,909, Cl. 425-387.100.
Jan Verstegen, Judicus M. P.; Verlijdonk, Johannus G.; de Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., to U.S. Philips Corporation. Luminescent material and discharge lamp containing the same. 4,382,207, Cl. 313-486.000.
Janez, John: *See*—
Svekis, James J.; and Janez, John, 4,381,758, Cl. 126-41.00R.
Jankovits, Tihamer: *See*—
Janosi, Istvan; Jankovits, Tihamer; Kiss, Lajos; Toth nee Balogh, Anna; Nagy, Beno; and Hadjinak, Janos, 4,382,096, Cl. 426-21.000.
Janome Sewing Machine Co. Ltd.: *See*—
Makabe, Hachiro; and Tanaka, Haruhiko, 4,381,721, Cl. 112-158.00E.
Janosi, Istvan; Jankovits, Tihamer; Kiss, Lajos; Toth nee Balogh, Anna; Nagy, Beno; and Hadjinak, Janos, to Kolacsai Suto-Es Edesipari Vallalat. Process for the preparation of high quality wheat bread capable of long term storage. 4,382,096, Cl. 426-21.000.
Janssen, Felix G.: *See*—
Roberts, Robert L.; and Janssen, Felix G., 4,381,998, Cl. 210-503.000.
Japan Steel Works, Ltd., The: *See*—
Watanabe, Juro; Ohnishi, Keizo; Ishiguro, Toru; and Ogawa, Takatoshi, 4,381,940, Cl. 75-124.000.
Jaques, Geoffrey S.: *See*—
Boreland, William; Dossor, John M.; and Jaques, Geoffrey S., 4,382,008, Cl. 252-75.000.
Jean Walterscheid GmbH: *See*—
Herchenbach, Paul, 4,382,202, Cl. 310-328.000.
Jefferson Industries Company: *See*—
Dill, Terry A., 4,381,731, Cl. 119-21.000.
Jelonek, Chester J.; and Schlagel, Norman. Continuous flow earmold tubing connector. 4,381,830, Cl. 181-129.000.
Jenning, Ellen M.: *See*—
Liao, John C.; Ponzo, John L.; and Jenning, Ellen M., 4,382,075, Cl. 424-3.000.
Jiewertz, Sten R., to Saab-Scania Aktiebolag. Method and device for regulating the signal level from a transducer connected to an internal combustion engine. 4,381,662, Cl. 73-35.000.
Jodoin, Raymond C., to Rogers Corporation. Multilayer bus bar fabrication technique. 4,382,156, Cl. 174-72.00B.
John Thomas Batts, Inc.: *See*—
Duester, Everett L.; and Garrison, Judd F., 4,381,599, Cl. 29-717.000.
Johnson, Clyde V.; and Huijnen, Wilhelmus G. J., to Occidental Research Corp. In situ roasting and leaching of sulfide minerals. 4,381,873, Cl. 299-5.000.
Johnson & Johnson: *See*—
Elias, Robert T., 4,381,783, Cl. 604-368.000.
Johnson & Johnson Baby Products Company: *See*—
Lindemann, Martin K. O.; Lukenbach, Elvin R.; and Verdicchio, Robert J., 4,382,036, Cl. 260-403.000.
Johnson, Steven H.: *See*—
Boucher, Terry D.; Hlavinka, Dennis J.; Kenshalo, Richard M.; and Johnson, Steven H., 4,381,999, Cl. 210-637.000.
Jolly, Richard D.: *See*—
Croy, David G.; Hollingsworth, Lee M.; Williams, Leonard E., Jr.; Jolly, Richard D.; and Tate, Mark C., 4,381,868, Cl. 277-27.000.
Jones, Floyd L.: *See*—
Watson, Keith M.; Jones, Floyd L.; and Adams, Dwight V., 4,382,058, Cl. 264-527.000.
Jones, Orval. Sewing machine light fixture. 4,382,273, Cl. 362-90.000.
Joseph, Craig L., to FMC Corporation. System for controlling the movement of a rotatable member. 4,382,216, Cl. 318-630.000.
Joseph Oat Corporation: *See*—
Holtz, Maurice; and Singh, Krishna P., 4,382,060, Cl. 376-272.000.
Joyce, Robert H.; Black, David H. A.; and Plangger, Franz O., to Northern Telecom Limited. Buffering speech signals in a TASI system. 4,382,296, Cl. 370-81.000.
Jung, Rolf; and Wienen, Walter, to Krauss u. Reichert GmbH & Co. KG. Web laying method and apparatus. 4,381,859, Cl. 270-31.000.
Junkosha Co., Ltd.: *See*—
Suzuki, Hirosuke, 4,382,236, Cl. 333-1.000.
Jupe, Christoph; Waldmann, Helmut; Baumert, Jurgen; and Schummer, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of pyrocatechol and hydroquinone. 4,381,973, Cl. 203-80.000.
Kahl, Karl H. Low cost, low pressure, solar heated fence surrounding a swimming pool. 4,381,763, Cl. 126-416.000.
Kahn, Merle S., to Reynolds Metals Company. Membrane closure structure. 4,381,848, Cl. 229-43.000.
Kaiser, Carl: *See*—
Holden, Kenneth G.; Kaiser, Carl; and Weinstock, Joseph, 4,382,029, Cl. 260-239.0BB.
Kajimura, Motoji; Echigo, Hiroyuki; and Hashizume, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Image pickup apparatus. 4,382,213, Cl. 315-382.000.
Kakugo, Masahiro: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Yamada, Koji; and Sadatoshi, Hajime, 4,382,065, Cl. 422-147.000.
Kali-Chemie Pharma GmbH: *See*—
Zeugner, Horst; Roemer, Dietmar; and Liepmann, Hans, 4,382,030, Cl. 260-239.0BD.
Kalk, Franklin D.: *See*—
Goldstein, Irving S.; Kalk, Franklin D.; and Deckman, Harry W., 4,381,963, Cl. 156-245.000.
Kalyanasundaram, Kuppuswamy: *See*—
Gratzel, Michael; Kiwi, John; Kalyanasundaram, Kuppuswamy; and Philp, John, 4,381,978, Cl. 204-75.000.
Kamata, Isao: *See*—
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Kamoshita, Katsuzo: *See*—
Kosuge, Yoshiaki; Yoshida, Ryo; Sumida, Seizo; Oshita, Hirofumi; Otsuki, Soji; and Kamoshita, Katsuzo, 4,381,935, Cl. 71-88.000.
Kan, Peter T.: *See*—
Narayan, Thirumurti; Kan, Peter T.; and Patton, John T., Jr., 4,382,125, Cl. 521-160.000.
Kando, Yasuhiko: *See*—
Yokokura, Hisao; Kitamura, Teruo; Ito, Ren; Nakano, Fumio; Morishita, Hirosada; Sato, Mikio; and Kando, Yasuhiko, 4,381,886, Cl. 350-341.000.
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, to BASF Wyandotte Corporation. Anionic surfactant compositions effective in aqueous solutions of strongly ionizable salts. 4,382,013, Cl. 252-354.000.
Kanki, Kazuhiko: *See*—
Takagi, Toshinori; Nakata, Shinsaku; Kanki, Kazuhiko; and Hotta, Masahiro, 4,382,110, Cl. 428-336.000.
Kannert, Paul: *See*—
Bischlipp, Klaus; Pfeiffer, Jurgen; and Kannert, Paul, 4,381,907, Cl. 425-110.000.
Kapteina, Friedhelm; and Rink, Jurgen, to Didier Engineering GmbH. Process and apparatus for continuous production of polyesters. 4,382,139, Cl. 528-502.000.
Karwat, Heinz, to Linde Aktiengesellschaft. Method and apparatus for regulating ammonia concentration during scrubbing of gaseous mixtures. 4,381,926, Cl. 55-48.000.
Kato, Marehito: *See*—
Matsumoto, Hideo; Takahashi, Minoru; and Kato, Marehito, 4,381,910, Cl. 425-398.000.

Kato, Minoru, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic head. 4,382,269, Cl. 360-121.000.

Katz, Lawrence E.; Gay, Walter A.; and Rothgery, Eugene F., to Olin Corporation. Selected O-(2-trichloromethyl-4-pyrimidinyl)-O,O-dialkyl phosphorothionates and O-(2-trichloromethyl-4-pyrimidinyl)-O,O-dialkyl phosphoronates and their use as insecticides. 4,382,087, Cl. 424-200.000.

Katz, Robert. Printing roller with removable cylinder. 4,381,709, Cl. 101-375.000.

Kaufman, Alan L.: *See*—
Spidell, Vernon B., 4,381,622, Cl. 47-33.000.

Kaule, Walter; and Primbsch, Erik, to Krautkramer-Branson, Incorporated. Apparatus for sensing ultrasonic waves by optical means. 4,381,676, Cl. 73-657.000.

Kawai, Hisasi: *See*—
Morino, Seiji; Kawai, Hisasi; and Tokura, Norihito, 4,381,757, Cl. 123-606.000.

Kawase, Takenori: *See*—
Takeuchi, Toshikatu; Goto, Kihei; Ichihashi, Yasuro; and Kawase, Takenori, 4,381,722, Cl. 112-235.000.

Kaye, Donald J.: *See*—
Goodnow, Robert A.; Shade, Floyd J.; Sloboth, Thomas A.; and Kaye, Donald J., 4,381,773, Cl. 128-200.140.

Kebe, Taib. Calendar. 4,381,614, Cl. 40-118.000.

Kedma, Incorporated: *See*—
Gabbay, Shlomo, 4,381,771, Cl. 128-129.000.

Keefer, Frank J.: *See*—
Guistini, Fernando G.; Keefer, Frank J.; and Keefer, Robert F., 4,381,772, Cl. 128-132.00R.

Keefer, Robert F.: *See*—
Guistini, Fernando G.; Keefer, Frank J.; and Keefer, Robert F., 4,381,772, Cl. 128-132.00R.

Kelley, Joseph M.; and Roderick, John J., to El Paso Polyolefins Company. High pressure polyethylene process. 4,382,132, Cl. 526-145.000.

Kelly, Guy M.: *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., 4,381,705, Cl. 101-69.000.

Kenjorski, Arthur A. Splitting ax. 4,381,809, Cl. 145-2.00R.

Kennecott Corporation: *See*—
Smith, Russell D.; and Tressler, Richard E., 4,382,104, Cl. 427-226.000.

Kenney, John T.: *See*—
Baron, William J.; Kenney, John T.; and Townsend, Wesley P., 4,381,951, Cl. 134-26.000.

Kenshalo, Richard M.: *See*—
Boucher, Terry D.; Hlavinka, Dennis J.; Kenshalo, Richard M.; and Johnson, Steven H., 4,381,999, Cl. 210-637.000.

Kestner, Daniel W., Jr.; and Forbes, Frank, to Dravo Corporation. Fine particulate removal from oil shale on a travelling grate retort. 4,381,988, Cl. 208-11.00R.

Kiguchi, Takashi: *See*—
Doi, Kazuyori; Kiguchi, Takashi; and Yamada, Naoyuki, 4,382,059, Cl. 376-210.000.

Kim, Bongsub: *See*—
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,382,013, Cl. 252-354.000.

Kim, Syng N., to Wico Corporation. Joystick with built-in fire button. 4,382,166, Cl. 200-6.00A.

Kimberly-Clark Corporation: *See*—
Aberson, Gerard M.; and Powell-Toothman, Robin, 4,381,784, Cl. 605-368.000.
Mazurak, Peter A.; and Fries, Donald M., 4,381,782, Cl. 604-368.000.
Sciaraffa, Michael A.; and Boland, Leona G., 4,381,781, Cl. 604-372.000.

Kimble, Thomas E., to Baldwin Piano & Organ Company. Cymbal stand. 4,381,690, Cl. 84-422.00R.

Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorinated cation exchange membrane and process for preparing the same. 4,382,123, Cl. 521-27.000.

Kimura, Osamu, to Horiba Ltd. X-Ray detector of semiconductor type. 4,382,183, Cl. 250-310.000.

King, Reginald A.: *See*—
Gosling, Harold W.; and King, Reginald A., 4,382,160, Cl. 179-15.55R.

Kircher, Morton S., to Olin Corporation. Electrode frame. 4,381,984, Cl. 204-258.000.

Kirchner, Horst: *See*—
Schreiber, Friedrich; and Kirchner, Horst, 4,381,603, Cl. 30-43.920.

Kirchner, Klaus: *See*—
Arbeletche, Carlos; Boelcke, Ingo; Poehlmann, Peter; and Kirchner, Klaus, 4,381,897, Cl. 406-93.000.

Kirpaty, Vladimir A.: *See*—
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N., 4,382,169, Cl. 219-76.100.

Kiss, Lajos: *See*—
Janosi, Istvan; Jankovits, Tihamer; Kiss, Lajos; Toth nee Balogh, Anna; Nagy, Beno; and Hadjinak, Janos, 4,382,096, Cl. 426-21.000.

Kitajima, Eiji: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tomonori, 4,381,990, Cl. 208-39.000.

Kitamura, Hirotsugu; Shimizu, Yasumasa; and Ohura, Osami, to Tokai Denka Kogyo Kabushiki. Process for isolating 4,4-dihydroxydiphenyl sulfone from a mixture of dihydroxydiphenylsulfone isomers. 4,382,147, Cl. 568-33.000.

Kitamura, Hiroyuki: *See*—
Koyanagi, Takuji; Ono, Nobuhiro; and Kitamura, Hiroyuki, 4,382,055, Cl. 264-133.000.

Kitamura, Teruo: *See*—
Yokokura, Hisao; Kitamura, Teruo; Ito, Ren; Nakano, Fumio; Morishita, Hirosada; Sato, Mikio; and Kando, Yasuhiko, 4,381,886, Cl. 350-341.000.

Kitrilakis, Sotiris: *See*—
Robinson, Thomas C.; and Kitrilakis, Sotiris, 4,381,567, Cl. 3-1.700.

Kitsugi, Naomichi: *See*—
Otsuka, Toyozo; Kitsugi, Naomichi; and Fujinaga, Teruo, 4,382,071, Cl. 423-341.000.

Kiwi, John: *See*—
Gratzel, Michael; Kiwi, John; Kalyanasundaram, Kuppuswamy; and Philp, John, 4,381,978, Cl. 204-75.000.

Kiyozuka, Noboru, to Nippon Electric Co., Ltd. Logic having inhibit mean preventing erroneous operation circuit. 4,382,197, Cl. 307-470.000.

Klauba, Bruce; and Titone, Roger, to Martin Engineering Company. Vibrational stress relief. 4,381,673, Cl. 73-579.000.

Klaus, Peter; and Westerkamp, Jurgen, to Windmoller & Holscher. Mechanism for lifting and lowering an impression cylinder with spring-biased multiple disc brake locking device. 4,381,707, Cl. 101-282.000.

Klingel, Hans, to Trumpf GmbH & Co. Thermal cutting jet device with suction apparatus. 4,382,170, Cl. 219-121.0PP.

Klioze, Solomon S.; and Ehrgott, Frederick J., to Hoechst-Roussel Pharmaceuticals, Inc. Cis- and trans-4-(4-bromophenoxy)-1-[6-fluoro-1,2-benzisoxazole-3-yl)propyl]-3-phenylpiperidines. 4,382,141, Cl. 546-198.000.

Koa Oil Company, Limited: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tomonori, 4,381,990, Cl. 208-39.000.

Kobayashi, Nobuyuki; Itoh, Hiroshi; and Otsuki, Hiromi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Idling speed control device of an internal combustion engine. 4,381,747, Cl. 123-339.000.

Koester, Eberhard; Deigner, Paul; Schaefer, Dieter; Uhl, Karl; and Falk, Roland, to BASF Aktiengesellschaft. Device for magnetically orienting the magnetizable particles or magnetic recording media in a preferred direction. 4,382,244, Cl. 335-284.000.

Koester, John H. Foundation vent structure. 4,381,630, Cl. 52-169.500.

Kohl, Helmut, to Behringwerke Aktiengesellschaft. Test agent for the detection of coupling compounds, and a process for its preparation. 4,382,062, Cl. 422-56.000.

Kohler, Karl-Heinz: *See*—
Binsack, Rudolf; Kohler, Karl-Heinz; Morbitzer, Leo; Bottenbruch, Ludwig; and Heitz, Walter, 4,382,131, Cl. 525-445.000.

Koike, Takaharu: *See*—
Yamamoto, Kimiaki; and Koike, Takaharu, 4,381,883, Cl. 350-164.000.

Koistinen, Arnold A., to Dakota Plastics Company. Add-water funnel and card holder. 4,381,623, Cl. 47-48.500.

Kolacsai Suto-Es Edcsipari Vallalat: *See*—
Janosi, Istvan; Jankovits, Tihamer; Kiss, Lajos; Toth nee Balogh, Anna; Nagy, Beno; and Hadjinak, Janos, 4,382,096, Cl. 426-21.000.

Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, to Matsushita Electric Works, Ltd. Circuit breaker. 4,382,240, Cl. 335-8.000.

Kongskilde Koncernselskab A/S: *See*—
Hansen, Jens O. E., 4,381,930, Cl. 55-339.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Uehara, Masafumi; and Itano, Mitsuyoshi, 4,381,946, Cl. 106-22.000.

Kopcynski, Wink H.: *See*—
Ogles, Ethridge F., 4,381,695, Cl. 91-178.000.

Kopicky, Edward E.: *See*—
Ackman, Mark E.; Dufek, Wayne L.; McCarthy, Charles C.; and Kopicky, Edward E., 4,382,287, Cl. 364-900.000.

Korach, Malcolm, to PPG Industries, Inc. Solid polymer electrolyte cell. 4,381,983, Cl. 204-252.000.

Koral, Joseph R., to Mirro Corporation. Microwave coffee making apparatus. 4,381,696, Cl. 99-304.000.

Korhonen, Kaarlo J. Plant and gripping means for cutting up meat. 4,381,582, Cl. 17-44.300.

Kosuge, Yoshiaki; Yoshida, Ryo; Sumida, Seizo; Oshita, Hirofumi; Otsuki, Soji; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Oximecarbamate derivatives, and their production and use. 4,381,935, Cl. 71-88.000.

Kosugi, Kunio: *See*—
Sakai, Shizuyoshi; Fujinami, Tatsuo; Kosugi, Kunio; Takemura, Hiroshi; and Sagesaka, Michiaki, 4,382,014, Cl. 252-356.000.

Kotani, Shozo: *See*—
Shiba, Tetsuo; Yamamura, Yuichi; Kotani, Shozo; Nagase, Osamu; and Ogawa, Hidemasa, 4,382,080, Cl. 424-177.000.

Kottke, Roger H., to Quaker Oats Company, The. Method for manufacturing foundry cores. 4,381,813, Cl. 164-527.000.
Kovacic, Guido: *See—*
Hoffacker, Franz; Kovacic, Guido; and Luhrig, Hermann, 4,381,891, Cl. 354-276.000.
Koval, Ivan A.: *See—*
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N., 4,382,169, Cl. 219-76.100.
Kowa Co., Ltd.: *See—*
Takatori, Kichitaro; Yamaguchi, Takashi; and Nagakura, Masahiko, 4,382,142, Cl. 548-139.000.
Koyanagi, Takuji; Ono, Nobuhiro; and Kitamura, Hiroyuki. Lightweight and dimensionally accurate resin concrete molded products, and a method of making the same. 4,382,055, Cl. 264-133.000.
Kozam, George; and Romanelli, Pat. Needle-loading multiple barrel syringe. 4,381,778, Cl. 604-191.000.
Kraft, Joseph K., to Westinghouse Electric Corp. Track splice. 4,381,851, Cl. 238-232.000.
Kramer, Melvin G., to Brunton Company, The. Self-contained downhole compass. 4,381,610, Cl. 33-312.000.
Krauss u. Reichert GmbH & Co. KG: *See—*
Jung, Rolf; and Wienen, Walter, 4,381,859, Cl. 270-31.000.
Krautkramer-Branson, Incorporated: *See—*
Kaule, Walter; and Primbsch, Erik, 4,381,676, Cl. 73-657.000.
Krautz, Alfons O. Sectional smokestack. 4,381,717, Cl. 110-184.000.
Kress, Robert R., to Record Industrial Company. Sheath-core yarn for severe thermal protecting fabrics and method therefor. 4,381,639, Cl. 57-229.000.
Krisel, Elisabeth, to Quaker Oats Company, The. Toy flat article construction set. 4,381,618, Cl. 46-22.000.
Krogsrud, Harald, to Elkem a/s. Method for processing a solid gravel like material with a fluid. 4,382,073, Cl. 423-658.500.
Krome, Gerd: *See—*
Laurer, Peter R.; Krome, Gerd; Cordemans, Luc; Seifert, Reinhard; and Danz, Eckehard, 4,382,021, Cl. 252-441.000.
Krovinovic, Zdravko: *See—*
Hirt, Dieter; Krovinovic, Zdravko; and Schmitt, Rupert, 4,381,708, Cl. 101-365.000.
Krueger, Bruno O., to Borden, Inc. Supported silver catalyst. 4,382,149, Cl. 568-473.000.
Krupp Polysius AG: *See—*
Arbeletche, Carlos; Boelcke, Iago; Poehlmann, Peter; and Kirchner, Klaus, 4,381,897, Cl. 406-93.000.
Kubo, Koji; Nishikawa, Mineo; and Sugi, Hikaru, to Nippondenso Co., Ltd. Silencer in a refrigeration system. 4,381,651, Cl. 62-296.000.
Kucera, Clare H.; and Connell, Richard B., to Dow Chemical Company, The. Breaker system for hydraulic fracturing fluids. 4,382,003, Cl. 252-8.55R.
Kuczkowski, Joseph A.: *See—*
Wideman, Lawson G.; and Kuczkowski, Joseph A., 4,382,152, Cl. 585-430.000.
Kudo, Satoru; Ohkubo, Kiyokazu; and Nakayama, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Reverse-drive blocking latch for an automotive transmission. 4,381,682, Cl. 74-476.000.
Kuehler, Christopher W., to Chevron Research Company. Hydroprocessing carbonaceous feedstocks containing asphaltenes. 4,381,987, Cl. 208-10.000.
Kugler, H. Dale: *See—*
Kugler, Lane N.; and Kugler, H. Dale, 4,381,996, Cl. 210-195.100.
Kugler, Lane N.; and Kugler, H. Dale. Method and device for cleaning livestock dipping vat solution to be used in conjunction with a dipping vat. 4,381,996, Cl. 210-195.100.
Kugushin, Alexandr A.; Bespalov, Vladimir N.; Labetsky, Jury O.; Druzin, Vyacheslav I.; Smirnov, Vitaly K.; and Shilov, Vladislav A. Method of I-section rolling in continuous mill. 4,381,658, Cl. 72-234.000.
Kuhner, Gerhard; Wolff, Siegfried; and Rothbuhr, Lothar, to Degussa Aktiengesellschaft. Resorcinol-filler preparation, process for the production and use of the same. 4,381,949, Cl. 106-307.000.
Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Use of activated carbon for separation of ethanol from water. 4,382,001, Cl. 210-674.000.
Kumada, Masaharu; and Misumi, Akira, to Hitachi, Ltd. Directly heated type oxide cathode. 4,382,206, Cl. 313-346.00R.
Kumura, Yukimasa: *See—*
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tononori, 4,381,990, Cl. 208-39.000.
Kunimoto, Wallace Y., to Santa Barbara Research Center. Demand flow cryostat. 4,381,652, Cl. 62-514.0JT.
Kunkle, Gerald E.; and Matesa, Joseph M., to PPG Industries, Inc. Glass batch liquefaction. 4,381,934, Cl. 65-135.000.
Kunze, Dieter, to Varta Batterie Aktiengesellschaft. Separator for electrochemical high temperature cell. 4,382,117, Cl. 429-132.000.
Kupper, Walter E., to Mettler Instrumente AG. Weighing scale of unitary construction. 4,381,826, Cl. 177-211.000.
Kurtz, Stewart K.: *See—*
Springer, William E.; and Kurtz, Stewart K., 4,381,790, Cl. 132-37.00R.
Kurz, Wolfgang; and Munz, Ulrich, to Robert Bosch GmbH. Series regulated rectifier circuit for a battery charging system. 4,382,222, Cl. 320-61.000.
Kusche, David W., to Brunswick Corporation. Exhaust system for three cylinder two-cycle engines. 4,381,644, Cl. 60-313.000.
Kuwayama, Hirotsugu; and Ichikawa, Hiroshi, to Meisei Chemical Works Co., Ltd.; and Idemitsu Kosan Company Limited. Method of treating fiber. 4,382,111, Cl. 428-375.000.
Kyburz, Emilio: *See—*
Hunkeler, Walter; and Kyburz, Emilio, 4,382,032, Cl. 260-239.30P.
Kyte, Louis D.; and Council, Malcolm N., to Otis Engineering Corporation. Hydraulic power pack. 4,381,904, Cl. 417-287.000.
Labaig, Jean-Jacques: *See—*
Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, 4,382,127, Cl. 524-504.000.
Labetsky, Jury O.: *See—*
Kugushin, Alexandr A.; Bespalov, Vladimir N.; Labetsky, Jury O.; Druzin, Vyacheslav I.; Smirnov, Vitaly K.; and Shilov, Vladislav A., 4,381,658, Cl. 72-234.000.
Labudde, Russell G. Anti-cavitation marine propeller. 4,381,901, Cl. 416-121.000.
Lacefield, William B.; and Simon, Richard L., to Eli Lilly and Company. 9-Aminoalkylfluorenes. 4,382,093, Cl. 424-324.000.
Laclede Professional Products, Inc.: *See—*
Pellico, Michael A., 4,381,947, Cl. 106-38.50D.
Lane, Richard H., to Motorola, Inc. Self-aligned buried channel fabrication process. 4,381,956, Cl. 148-175.000.
Lang, Gerard: *See—*
Jacquet, Bernard; and Lang, Gerard, 4,381,919, Cl. 8-405.000.
Latham, Allen, Jr., to Haemonetics Corporation. Anticoagulant dispensing apparatus and method of use. 4,381,776, Cl. 604-317.000.
Laughlin, William C.; and Tolley, William K., to UOP Inc. Recovery of cobalt values by absorption from ammoniacal solution. 4,382,082, Cl. 423-150.000.
Laurent, Pierre, to Thomson-CSF. Device for demodulating signals modulated by frequency-shift keying. 4,382,232, Cl. 329-117.000.
Laurer, Peter R.; Krome, Gerd; Cordemans, Luc; Seifert, Reinhard; and Danz, Eckehard, to BASF Aktiengesellschaft. Supported catalyst containing copper and alkali metals. 4,382,021, Cl. 252-441.000.
Lawrence, Howard, to E.I.T. Corporation. Hand-held shot tube detonator. 4,381,711, Cl. 102-275.110.
Lawrence, Paul J.: *See—*
Detweiler, Michael B.; Lawrence, Paul J.; and Townsley, Charles W., 4,382,064, Cl. 422-58.000.
Lawrence, Robert H., Jr.; and Hill, Phillip E., to Agrigenetics Research Associates Limited. High purity hybrid cabbage seed production. 4,381,624, Cl. 47-58.000.
Lawson, Michael B., to Halliburton Company. Method for removing iron sulfide scale from metal surfaces. 4,381,950, Cl. 134-3.000.
Lazarus, Stanley D.: *See—*
Chakravarti, Kalidas; and Lazarus, Stanley D., 4,381,640, Cl. 57-242.000.
Lechner, Ernst-Friedrich; and Meusel, Otto, to Siemens Aktiengesellschaft. Contact spring for low resistance connection of a circuit board to a grounded subassembly carrier. 4,381,878, Cl. 339-14.00R.
Lederer, Josef. Ski boot. 4,381,613, Cl. 36-121.000.
Lee, Hsi L.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,382,031, Cl. 260-239.30R.
Lee, Maryann O.: *See—*
Benjamin, Eric J.; Lee, Maryann O.; and Lin, Lih-Yang, 4,382,091, Cl. 424-273.00R.
Legge, Ronald N.; and Sarma, Kalluri R., to Motorola, Inc. Dopant predeposition from high pressure plasma source. 4,382,099, Cl. 427-34.000.
Leinenger, John T., to Modular Automation, Inc. Modular chuting. 4,381,834, Cl. 193-35.00J.
Lenz, Leonard L. Stepless infinite variable speed motor. 4,381,700, Cl. 91-497.000.
Lepp, Raymond J., to Inland Steel Company. Method and apparatus for removing irregular lap formations in coils of metal strip. 4,381,704, Cl. 100-35.000.
Leslie, Bruce E., to Thaxton Inc. Pipe tester plug. 4,381,800, Cl. 138-90.000.
Levande, George A.; and Schwarzenbart, Frederick J., to Imperial Clevite Inc. Method of cold forming coupling shell. 4,381,594, Cl. 29-508.000.
Levine, Joel L.; and Marek, Benjamin F., to Mobil Oil Corporation. Method for determining saturation characteristics of a porous material. 4,381,665, Cl. 73-73.000.
Li, George S., to Standard Oil Company. Polyolefin grafted with polycarboxylic acid, ester or anhydride and modified with polyhydroxy compound. 4,382,128, Cl. 524-513.000.
Liao, John C.; Ponzo, John L.; and Jenning, Ellen M., to Miles Laboratories, Inc. Stabilized Romanowsky stain solution. 4,382,075, Cl. 424-3.000.
Liberty Diversified Industries (Shamrock): *See—*
Rivkin, Eric M.; and Thorud, Stanley R., 4,381,836, Cl. 206-387.000.
LieBerman, Robert A.: *See—*
Sinka, Joseph V.; Higbie, Francis A.; and LieBerman, Robert A., 4,382,135, Cl. 526-301.000.
Lieder, Bernhard: *See—*
Schmidt, Volkmar; Lieder, Bernhard; Schewe, Heinrich; and Dohren, Hans, 4,381,924, Cl. 48-197.00R.
Liepmann, Hans: *See—*
Zeugner, Horst; Roemer, Dietmar; and Liepmann, Hans, 4,382,030, Cl. 260-239.0BD.

Lin, Lih-Yang: *See*—
Benjamin, Eric J.; Lee, Maryann O.; and Lin, Lih-Yang, 4,382,091, Cl. 424-273.00R.
Lind, Paul U.: *See*—
White, Thomas E.; and Lind, Paul U., 4,382,163, Cl. 179-99.0LC.
Linde Aktiengesellschaft: *See*—
Karwat, Heinz, 4,381,926, Cl. 55-48.000.
Lindemann, Martin K. O.; Lukenbach, Elvin R.; and Verdicchio, Robert J., to Johnson & Johnson Baby Products Company. Pyrophosphobetaines. 4,382,036, Cl. 260-403.000.
Linder, Ernst: *See*—
Eckert, Konrad; Muller, Klaus; Linder, Ernst; Maurer, Helmut; Rieger, Franz; Moser, Winfried; Franke, Horst; Burkel, Rainer; and Peter, Cornelius, 4,381,748, Cl. 123-414.000.
Lipp, Alfred: *See*—
Hunold, Klaus; Reinmuth, Klaus; and Lipp, Alfred, 4,381,931, Cl. 65-18.100.
Litton Business Systems Inc.: *See*—
Fenwick, Jay G., 4,381,876, Cl. 312-114.000.
Lock, Brian E., to RCA Corporation. Method and apparatus for separating a stamper from a mold. 4,381,964, Cl. 156-344.000.
Lockheed Corporation: *See*—
Cook, William C., 4,381,857, Cl. 267-64.150.
Cronin, Michael J., 4,382,188, Cl. 290-1.00C.
Lombard, Claude; and Rousseau, Christian. Pressure pick-up, especially for measuring the intake pressure of internal combustion engines. 4,381,678, Cl. 73-728.000.
Lombard, Claude, to Regie Nationale des Usines Renault. Pick-up for the measurement of the velocity of an ionization gas. 4,381,679, Cl. 73-861.050.
Lonseal Corporation: *See*—
Sato, Akira; and Waki, Tatsuo, 4,381,962, Cl. 156-244.110.
Lonsmin, Victor. Inexpensive writing instrument with illusion producing means. 4,381,615, Cl. 40-334.000.
Lorenz, Gary V.: *See*—
Engler, Edgar D.; and Lorenz, Gary V., 4,381,839, Cl. 212-208.000.
Loucaides, Nicholas, to General Electric Company. Thermal switch and dual filament long life lamp. 4,382,209, Cl. 315-65.000.
Love, Richard F.: *See*—
Chafetz, Harry; Love, Richard F.; and Waldbillig, James O., 4,382,007, Cl. 252-51.50A.
Lucas Industries, Ltd.: *See*—
Hill, William F., 4,381,752, Cl. 123-475.000.
Lucero, John A.: *See*—
Guerin, Jean-Michel; and Lucero, John A., 4,381,887, Cl. 350-358.000.
Ludvik, Josef A., to Reliance Electric Company. Hinge mechanism. 4,381,581, Cl. 16-259.000.
Luhrig, Hermann: *See*—
Hoffacker, Franz; Kovacic, Guido; and Luhrig, Hermann, 4,381,891, Cl. 354-276.000.
Lukenbach, Elvin R.: *See*—
Lindemann, Martin K. O.; Lukenbach, Elvin R.; and Verdicchio, Robert J., 4,382,036, Cl. 260-403.000.
Lula, Remus A.: *See*—
Beigay, Jack M.; and Lula, Remus A., 4,381,660, Cl. 72-342.000.
Lunn, Royston C.; MacAfee, J. Edwin; Grabowski, Robert C.; Renneker, Dennis N.; and Winkler, John W., to American Motors Corporation. Vehicle drive system having first and second operating modes and method of operating same. 4,381,828, Cl. 180-247.000.
Lurie, David. Desulfurization of flue gases with complete sulfite oxidation. 4,382,010, Cl. 252-184.000.
Lurie, David. Composition of matter useful in flue gas desulfurization process. 4,382,011, Cl. 252-184.000.
Lyons, John E.: *See*—
Rotolico, Anthony J.; Romero, Eduardo; and Lyons, John E., 4,381,898, Cl. 406-118.000.
Mac Engineering & Equip. Co., Inc.: *See*—
Simonton, Robert D.; and Schultz, Carl D., 4,381,596, Cl. 29-623.100.
MAC Valves, Inc.: *See*—
Neff, James A., 4,381,797, Cl. 137-599.000.
MacAfee, J. Edwin: *See*—
Lunn, Royston C.; MacAfee, J. Edwin; Grabowski, Robert C.; Renneker, Dennis N.; and Winkler, John W., 4,381,828, Cl. 180-247.000.
MacInnis, Martin B.: *See*—
Gingerich, Richard G.; Vanderpool, Clarence D.; Scheithauer, Richard A.; and MacInnis, Martin B., 4,381,937, Cl. 75-0.5AA.
MacLeod, Richard J., to Tapco Products Company, Inc. Mounting ornamental window shutters. 4,381,633, Cl. 52-473.000.
MacQueen, Donald K.: *See*—
Wood, William E.; and MacQueen, Donald K., 4,381,992, Cl. 208-179.000.
Madgavkar, Ajay M.; and Swift, Harold E., to Gulf Research & Development Company. Substoichiometric combustion of low heating value gases. 4,381,641, Cl. 60-39.060.
Maeda, Rikuzo, to Matsumura Oil Research Corporation. Hydraulic fluid containing water and an $\alpha,\omega$-polybutadienedicarboxylic acid. 4,382,009, Cl. 252-79.000.
Maes, Jean P., to S. A. Texaco Belgium N.V. Sacrificial cathodic protection system. 4,381,981, Cl. 204-197.000.
Magnusson, Alan B.: *See*—
Herweh, John E.; Garrett, Thomas B.; and Magnusson, Alan B., 4,382,134, Cl. 526-268.000.
Maher, Joseph A., Jr.; and Zafiropoulo, Arthur W., to Drytek, Inc. Multi-planar electrode plasma etching. 4,381,965, Cl. 156-345.000.
Mair, Alex C., to General Motors Corporation. Variable ares swirl generating engine cylinder inlet port. 4,381,743, Cl. 123-188.00M.
Maisch, Wolfgang; Peters, Jurgen; Wissmann, Michael; Gmelin, Karl; and Stiefel, Peter, to Robert Bosch GmbH. Fuel injection system. 4,381,751, Cl. 123-454.000.
Maistrelli, Roger, to Regie Nationale des Usines Renault. Servomotor featuring a servovalve controlling a hydraulic drum motor. 4,381,701, Cl. 91-499.000.
Makabe, Hachiro; and Tanaka, Haruhiko, to Janome Sewing Machine Co. Ltd. Electronic sewing machine. 4,381,721, Cl. 112-156.00E.
Makhteshim Chemical Works Ltd.: *See*—
Buchbinder, Emanuel, 4,382,077, Cl. 424-40.000.
Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Company, Limited. Band stop filter and circuit arrangement for common antenna. 4,382,238, Cl. 333-134.000.
Malchesky, Paul S.: *See*—
Nose', Yukihiko; and Malchesky, Paul S., 4,381,775, Cl. 604-6.000.
Maliarik, Mary J.: *See*—
Rohrbach, Ronald P.; and Maliarik, Mary J., 4,382,121, Cl. 435-94.000.
Mancini, Ugo. Apparatus for producing ravioli and the like. 4,381,906, Cl. 425-106.000.
Mandel, Evan W.; and Quirin, William, to Mattel, Inc. Electronic horse race analyzer. 4,382,280, Cl. 364-412.000.
Manville Service Corporation: *See*—
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., 4,381,634, Cl. 52-506.000.
Marchese, Joseph N., to Zenith Radio Corporation. Closure panel retention means. 4,381,843, Cl. 220-335.000.
Marek, Benjamin F.: *See*—
Levine, Joel L.; and Marek, Benjamin F., 4,381,665, Cl. 73-73.000.
Margulies, Herman, to Sterling Drug Inc. Deformable slidable piston to provide self-aspiration in hypodermic cartridge ampoules. 4,381,779, Cl. 604-202.000.
Marks, Michael R.: *See*—
Ehrenfels, Alfred L.; and Marks, Michael R., 4,381,879, Cl. 339-44.00R.
Marschner, Frank W., to Colgate/Palmolive. Bicarbonate containing stick deodorant. 4,382,079, Cl. 424-65.000.
Marshall, Francis G.; and Moore, Ralph F., to Bridgeport Metal Goods Mfg. Co., The. Rechargeable battery pack and combination thereof with lantern. 4,382,220, Cl. 320-2.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. 3-Formyl-4-methyl-pentanoic acids. 4,382,037, Cl. 260-465.00F.
Martelli, Gian N.: *See*—
De Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N., 4,381,979, Cl. 204-98.000.
Martin Engineering Company: *See*—
Klauba, Bruce; and Titone, Roger, 4,381,673, Cl. 73-579.000.
Martin, G. Blair: *See*—
Carver, George P.; Heap, Michael P.; Martin, G. Blair; Pershing, David W.; Rees, Dee P.; and Zallen, Dennis M., 4,381,718, Cl. 110-347.000.
Martinez, Christian: *See*—
Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, 4,382,127, Cl. 524-504.000.
Martinez, Fernando: *See*—
Abbes, Claude; Martinez, Fernando; and Rouaud, Christian, 4,381,869, Cl. 277-236.000.
Maruyama, Takeshige; and Iwasaki, Sadayoshi, to Alps Electric Co., Ltd. Push-button switch. 4,382,167, Cl. 200-153.00J.
Mas, Joseph A., to Allied Corporation. Magnetic core winding apparatus. 4,381,600, Cl. 29-738.000.
Maschinenfabrik Moenus AG: *See*—
Trutschel, Willi, 4,381,655, Cl. 69-38.000.
Master Industries, Inc.: *See*—
Norman, Bill, 4,381,863, Cl. 273-63.00A.
Matesa, Joseph M.: *See*—
Kunkle, Gerald E.; and Matesa, Joseph M., 4,381,934, Cl. 65-135.000.
Matsumoto, Hideo; Takahashi, Minoru; and Kato, Marehito, to Aisin Seiki Kabushiki Kaisha. Apparatus for molding pulley for toothed belts. 4,381,910, Cl. 425-398.000.
Matsumura Oil Research Corporation: *See*—
Maeda, Rikuzo, 4,382,009, Cl. 252-79.000.
Matsushita Electric Industrial Company, Limited: *See*—
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,382,238, Cl. 333-134.000.
Matsushita Electric Works, Ltd.: *See*—
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,382,240, Cl. 335-8.000.
Ohashi, Hiroshi; and Takada, Yuji, 4,382,252, Cl. 340-562.000.
Matsuzaka, Takashi; and Todokoro, Hideo, to Hitachi, Ltd. Method of displaying an image of phase contrast in a scanning transmission electron microscope. 4,382,182, Cl. 250-307.000.
Mattel, Inc.: *See*—
Mandel, Evan W.; and Quirin, William, 4,382,280, Cl. 364-412.000.
Matthey Rustenburg Refiners (Pty.) Ltd.: *See*—
Grant, Richard A., 4,382,067, Cl. 423-22.000.
Maurer, Helmut: *See*—
Eckert, Konrad; Muller, Klaus; Linder, Ernst; Maurer, Helmut; Rieger, Franz; Moser, Winfried; Franke, Horst; Burkel, Rainer; and Peter, Cornelius, 4,381,748, Cl. 123-414.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Eibl, Hansjorg, 4,382,035, Cl. 260-403.000.
Maxwell Products, Inc.: *See*—
Elliott, Franklin E., 4,381,571, Cl. 5-66.000.
May, Carl J., Jr., to Bell Telephone Laboratories, Incorporated. Signal stretcher for envelope generator. 4,382,164, Cl. 179-170.200.
Mazurak, Peter A.; and Fries, Donald M., to Kimberly-Clark Corporation. Highly absorbent materials having good wicking characteristics which comprise hydrogel particles and surfactant treated filler. 4,381,782, Cl. 604-368.000.
McAleer, William J.: *See*—
Hurni, William M.; Miller, William M.; and McAleer, William J., 4,382,076, Cl. 436-531.000.
McBrayer, Robert D.: *See*—
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., 4,381,815, Cl. 165-10.000.
McCarthy, Charles C.: *See*—
Ackman, Mark E.; Dufek, Wayne L.; McCarthy, Charles C.; and Kopicky, Edward E., 4,382,287, Cl. 364-900.000.
McChesney, Richard M.: *See*—
Brown, Peter W.; DuBois, Chester G.; and McChesney, Richard M., 4,382,047, Cl. 261-41.00D.
McClellan, Thomas R.: *See*—
Carroll, Woodrow; and McClellan, Thomas R., 4,382,108, Cl. 428-326.000.
McConnell, Anthony D.; and Garner, Robert H., to Anglo-American Clays Corporation. Anhydrous kaolin clay pigment and method of preparation. 4,381,948, Cl. 106-288.00B.
McConnell, Matthew L.: *See*—
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,381,675, Cl. 73-620.000.
McCord, Kenneth R.: *See*—
Barger, Larry N.; and McCord, Kenneth R., 4,381,591, Cl. 29-157.10R.
McDaniel, Max P., to Phillips Petroleum Company. Silica having titanium incorporated through use of peroxide. 4,382,022, Cl. 252-452.000.
McDonnell Douglas Corporation: *See*—
Hofmeister, Michael G.; and Amason, Myron P., 4,382,049, Cl. 264-40.100.
McGill, Robert N., to Du Pont de Nemours, E. I., and Company. Hydrocyanation of olefins. 4,382,038, Cl. 260-465.80R.
McGinnes Manufacturing Company: *See*—
Hahn, Oscar W., 4,381,872, Cl. 294-70.000.
McIver, Chandler H., to Honeywell Information Systems Inc. Method of mounting an I.C. chip on a substrate. 4,381,602, Cl. 29-840.000.
McLellan, Dale L.: *See*—
Feiertag, Frederick J.; and McLellan, Dale L., 4,381,666, Cl. 73-87.000.
McQuaid, Paul E., to Xerox Corporation. Master for device replication. 4,382,103, Cl. 427-145.000.
McSweeny, Edward S., Jr., to Weyerhaeuser Company. Fish net with reduced bottom friction. 4,381,617, Cl. 43-9.000.
McVey, Charles W., to Stratford Manufacturing, Inc. Speed control for fan motor. 4,382,218, Cl. 318-812.000.
Meddaugh, Gard; Tanabe, Eiji; and Vaguine, Victor, to Varian Associates, Inc. Variable field coupled cavity resonator circuit. 4,382,208, Cl. 315-5.410.
Medical Engineering Corporation: *See*—
Finney, Roy P., 4,381,767, Cl. 128-79.000.
Medtronic, Inc.: *See*—
Duggan, Stephen R., 4,381,786, Cl. 128-419.0PG.
Meisei Chemical Works Co., Ltd.: *See*—
Kuwayama, Hirotsugu; and Ichikawa, Hiroshi, 4,382,111, Cl. 428-375.000.
Meissner, David C.: *See*—
Ahrendt, William A.; Meissner, David C.; Sanzenbacher, Charles W.; and Scarlett, John C., 4,381,939, Cl. 75-82.000.
Meitzner, Erich F.; and Oline, James A., to Rohm and Haas Company. Process for preparing macroreticular resins, copolymers and products of said process. 4,382,124, Cl. 521-38.000.
Meleshko, Nikolai N.: *See*—
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N., 4,382,169, Cl. 219-76.100.
Meloy Laboratories, Inc.: *See*—
Braude, Irwin A., 4,382,027, Cl. 260-112.00R.
Menaker, Arkady B.: *See*—
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N., 4,382,169, Cl. 219-76.100.
Mendelson, Robert M., to RCA Corporation. Self-quenching circuit. 4,382,192, Cl. 307-141.400.
Menju, Shinichi; and Kamata, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. AC-DC Electric power converting station. 4,382,276, Cl. 363-141.000.
Mennicken, Gerhard: *See*—
Hohlein, Peter; Uerdingen, Walter; Peltzer, Bernd; and Mennicken, Gerhard, 4,382,114, Cl. 428-423.100.
Merck & Co., Inc.: *See*—
Hurni, William M.; Miller, William M.; and McAleer, William J., 4,382,076, Cl. 436-531.000.
Merck Patent Gesellschaft mit beschraenkter Haftung: *See*—
Eidenschink, Rudolf; and Pohl, Ludwig, 4,382,012, Cl. 252-299.100.
Merkle, Ralph H., to General Motors Corporation. Wheelchair lift device. 4,381,899, Cl. 414-556.000.
Mettler Instrumente AG: *See*—
Kupper, Walter E., 4,381,826, Cl. 177-211.000.
Metz, Hugh J. Calculator pushbutton format attachment for pushbutton telephones. 4,382,162, Cl. 179-90.00A.
Metzger, Hubert, to Printing Machinery & Electronics, Inc. Rotogravure cylinder plating and de-plating apparatus. 4,381,982, Cl. 204-212.000.
Meusel, Otto: *See*—
Lechner, Ernst-Friedrich; and Meusel, Otto, 4,381,878, Cl. 339-14.00R.
Mezei, Louis M.; Jacobs, Laurence N.; and Berry, Samuel C., to Sherwood Medical Industries Inc. Calcium assay. 4,382,122, Cl. 436-74.000.
Michael-David Laboratories: *See*—
Garlen, David, 4,381,920, Cl. 8-406.000.
Michienzi, Giacomo F. Alignment apparatus. 4,381,853, Cl. 249-205.000.
Micro-Mega S.A.: *See*—
Garnier, Marcel, 4,381,777, Cl. 604-188.000.
Sargenti, Angelo, 4,381,917, Cl. 433-114.000.
Micro Pure Systems, Inc.: *See*—
Abts, Leigh R., 4,381,674, Cl. 73-599.000.
Microlife Technics, Inc.: *See*—
Vedamuthu, Ebenezer R.; and Shah, Ramesh B., 4,382,097, Cl. 426-43.000.
Midrex Corporation: *See*—
Ahrendt, William A.; Meissner, David C.; Sanzenbacher, Charles W.; and Scarlett, John C., 4,381,939, Cl. 75-82.000.
Miki, Masayoshi: *See*—
Ito, Naoya; Yoshida, Takeshi; Aoki, Masahiro; Okubo, Masao; and Miki, Masayoshi, 4,381,941, Cl. 75-130.500.
Miles Laboratories, Inc.: *See*—
Liao, John C.; Ponzo, John L.; and Jenning, Ellen M., 4,382,075, Cl. 424-3.000.
Miller, Arthur F.: *See*—
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,381,977, Cl. 204-74.000.
Miller, Emmett L., to United States of America, National Aeronautics and Space Administration. Electronic system for high power load control. 4,382,224, Cl. 323-269.000.
Miller, Francis M., to Conax Corporation. Fluid conductivity sensor. 4,382,231, Cl. 324-439.000.
Miller, G. Kirby; and Becker, Jon, to GTE Products Corporation. Tape transducer. 4,382,196, Cl. 307-400.000.
Miller, Harold N., to Exxon Research & Engineering Co. Oil-soluble nitrogen containing sulfonated polymers useful as oil additives. 4,382,005, Cl. 252-32.70E.
Miller, Jack E.: *See*—
Dopyera, Emil E.; and Miller, Jack E., 4,381,871, Cl. 285-261.000.
Miller, William M.: *See*—
Hurni, William M.; Miller, William M.; and McAleer, William J., 4,382,076, Cl. 436-531.000.
Minolta Camera Kabushiki Kaisha: *See*—
Sahara, Masayoshi; and Nakai, Masaaki, 4,381,889, Cl. 354-41.000.
Mirro Corporation: *See*—
Koral, Joseph R., 4,381,696, Cl. 99-304.000.
Misdom, Theodore H.: *See*—
Bessett, Clifford H.; and Misdom, Theodore H., 4,381,847, Cl. 229-2.50R.
Misumi, Akira: *See*—
Kumada, Masaharu; and Misumi, Akira, 4,382,206, Cl. 313-346.00R.
Mitchell, Joan L.; and Quarendon, Peter, to International Business Machines Corporation. Method and apparatus for compressing and decompressing strings of electrical digital data bits. 4,382,286, Cl. 364-900.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Denda, Masahiko; Sato, Shinichi; Wakamiya, Wataru; Harada, Hiroshi; Tsubouchi, Natsuro; and Miyoshi, Hirokazu, 4,381,595, Cl. 29-589.000.
Miya, Kazuhiko: *See*—
Sato, Kanemasa; Ueno, Sadayasu; Miya, Kazuhiko; Oyama, Yoshishige; and Nishimura, Yutaka, 4,381,668, Cl. 73-202.000.
Miyagi, Hideo; and Nakano, Jiro, to Toyota Jidosha Kabushiki Kaisha. Method of controlling the rotational speed of an internal combustion engine. 4,381,746, Cl. 123-339.000.
Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,382,123, Cl. 521-27.000.
Miyoshi, Hirokazu: *See*—
Denda, Masahiko; Sato, Shinichi; Wakamiya, Wataru; Harada, Hiroshi; Tsubouchi, Natsuro; and Miyoshi, Hirokazu, 4,381,595, Cl. 29-589.000.
Mizuno, Junzi; Takeuchi, Yukihisa; Fukami, Akira; Wakayama, Masao; and Tomita, Masahiro, to Nippon Soken, Inc. Apparatus for adsorbing fuel vapor. 4,381,929, Cl. 55-316.000.
Mobil Oil Corporation: *See*—
Horodysky, Andrew G., 4,382,006, Cl. 252-49.600.
Levine, Joel L.; and Marek, Benjamin F., 4,381,665, Cl. 73-73.000.
Mochizuki, Hirohiko: *See*—
Nakano, Masao; Baba, Fumio; and Mochizuki, Hirohiko, 4,382,194, Cl. 307-264.000.

**Modica, Frank S.:** *See—*
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,381,991, Cl. 208-113.000.

**Modine Manufacturing Company:** *See—*
Granetzke, Dennis C.; and Cook, Neal A., 4,381,816, Cl. 165-40.000.

**Modular Automation, Inc.:** *See—*
Leinenger, John T., 4,381,834, Cl. 193-35.00J.

**Moffitt, Bryan S.;** and Ross, Alexander R., to Bell Telephone Laboratories, Incorporated. Digital conference time slot interchanger. 4,382,295, Cl. 370-68.000.

**Molins Limited:** *See—*
Arthur, Hugh M., 4,381,730, Cl. 118-674.000.

**Momiyama, Kikuo,** to Canon Kabushiki Kaisha. Retrofocus type large aperture wide angle objective. 4,381,888, Cl. 350-458.000.

**Monsanto Company:** *See—*
Paget, G. Edward, 4,382,028, Cl. 260-112.00B.
Serlin, Irving; and Gardner, Donald M., 4,382,107, Cl. 428-212.000.

**Montaron, Bernard,** to Regie Nationale des Usines Renault. Collision detection system with safety devices. 4,381,829, Cl. 180-274.000.

**Moore, Ralph F.:** *See—*
Marshall, Francis G.; and Moore, Ralph F., 4,382,220, Cl. 320-2.000.

**Morbitzer, Leo:** *See—*
Binsack, Rudolf; Kohler, Karl-Heinz; Morbitzer, Leo; Bottenbruch, Ludwig; and Heitz, Walter, 4,382,131, Cl. 525-445.000.

**Morel, Henri,** to ITW de France. Self locking clamping collar. 4,381,585, Cl. 24-270.000.

**Mori, Kazuyuki,** to Nissan Motor Company, Limited. Electronic trip meter for an automotive vehicle. 4,382,178, Cl. 377-17.000.

**Mori, Tamotsu:** *See—*
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,382,240, Cl. 335-8.000.

**Morino, Seiji; Kawai, Hisasi;** and Tokura, Norihito, to Nippon Soken, Inc. Continuous type ignition device for an internal combustion engine. 4,381,757, Cl. 123-606.000.

**Morishita, Hirosada:** *See—*
Yokokura, Hisao; Kitamura, Teruo; Ito, Ren; Nakano, Fumio; Morishita, Hirosada; Sato, Mikio; and Kando, Yasuhiko, 4,381,886, Cl. 350-341.000.

**Moser, Winfried:** *See—*
Eckert, Konrad; Muller, Klaus; Linder, Ernst; Maurer, Helmut; Rieger, Franz; Moser, Winfried; Franke, Horst; Burkel, Rainer; and Peter, Cornelius, 4,381,748, Cl. 123-414.000.

**Motor Wheel Corporation:** *See—*
Strader, Don S., 4,381,874, Cl. 301-125.000.

**Motorola, Inc.:** *See—*
Lane, Richard H., 4,381,956, Cl. 148-175.000.
Legge, Ronald N.; and Sarma, Kalluri R., 4,382,099, Cl. 427-34.000.
Olivenbaum, James E.; and Bickley, Robert H., 4,382,227, Cl. 324-115.000.
Sumner, Terence E.; Ward, James; and Wilson, Alan L., 4,382,285, Cl. 364-724.000.

**Mount, Gordon L.,** to Carrier Corporation. Electronic control system for regulating startup operation of a compressor in a refrigeration system. 4,381,650, Cl. 62-157.000.

**Mueliner, James M.,** to Smarte Carte, Inc. Versatile cart apparatus. 4,381,870, Cl. 280-33.99B.

**Mulaskey, Bernard F.,** to Chevron Research Company. Catalyzed combustion in cracking catalyst. 4,382,023, Cl. 252-455.00Z.

**Muller, Klaus:** *See—*
Eckert, Konrad; Muller, Klaus; Linder, Ernst; Maurer, Helmut; Rieger, Franz; Moser, Winfried; Franke, Horst; Burkel, Rainer; and Peter, Cornelius, 4,381,748, Cl. 123-414.000.
Stecher, Gunther; Spitzenberger, Kurt; and Muller, Klaus, 4,382,247, Cl. 338-42.000.

**Mundel, Gerald:** *See—*
Pohl, Gunter; and Mundel, Gerald, 4,382,195, Cl. 307-280.000.

**Mundorf, Walter:** *See—*
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**Munz, Ulrich:** *See—*
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**Murakami, Manabu:** *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Ohgoh, Toshiharu; Murakami, Manabu; Oketani, Kiyoshi; and Fujisaki, Hideaki, 4,382,151, Cl. 568-875.000.

**Murooka, Rikichi:** *See—*
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**Murphy, Richard D.:** *See—*
Clelford, Douglas H.; and Murphy, Richard D., 4,382,283, Cl. 364-434.000.

**Myers, H. Allen,** to Sundstrand Corporation. Displacement control for a hydraulic pump or motor with failure override. 4,381,702, Cl. 91-506.000.

**Nagakura, Masahiko:** *See—*
Takatori, Kichitaro; Yamaguchi, Takashi; and Nagakura, Masahiko, 4,382,142, Cl. 548-139.000.

**Nagase, Osamu:** *See—*
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**Nagata, Koichi,** to Nippon Electric Co., Ltd. Paging receiver with display. 4,382,256, Cl. 340-825.440.

**Nagy, Beno:** *See—*
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**Nair, Kumaran M.,** to Du Pont de Nemours, E. I., and Company. Thick film conductor compositions. 4,381,945, Cl. 106-1.140.

**Nakai, Masaaki:** *See—*
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**Nakamura, Tsuyoshi:** *See—*
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**Nakano, Fumio:** *See—*
Yokokura, Hisao; Kitamura, Teruo; Ito, Ren; Nakano, Fumio; Morishita, Hirosada; Sato, Mikio; and Kando, Yasuhiko, 4,381,886, Cl. 350-341.000.

**Nakano, Jiro:** *See—*
Miyagi, Hideo; and Nakano, Jiro, 4,381,746, Cl. 123-339.000.

**Nakano, Masao; Baba, Fumio;** and Mochizuki, Hirohiko, to Fujitsu Limited. Boosting circuit. 4,382,194, Cl. 307-264.000.

**Nakao, Masashi:** *See—*
Umezawa, Hidetugu; Gotoh, Miyuki; Tanaka, Shigenori; and Nakao, Masashi, 4,381,807, Cl. 139-452.000.

**Nakata, Shinsaku:** *See—*
Takagi, Toshinori; Nakata, Shinsaku; Kanki, Kazuhiko; and Hotta, Masahiro, 4,382,110, Cl. 428-336.000.

**Nakauchi, Shunsaku,** to Secom Co., Ltd. Surveillance system in which a reflected signal pattern is compared to a reference pattern. 4,382,291, Cl. 367-93.000.

**Nakayama, Hiroshi:** *See—*
Kudo, Satoru; Ohkubo, Kiyokazu; and Nakayama, Hiroshi, 4,381,682, Cl. 74-476.000.

**Narayan, Thirumurti; Kan, Peter T.;** and Patton, John T., Jr., to BASF Wyandotte Corporation. Isocyanurate-modified polymethylene polyphenylene polyisocyanate compositions. 4,382,125, Cl. 521-160.000.

**Naser, Georg; Strahwald, Franz;** and Szehi, Erich, to Siemens Aktiengesellschaft. Electrode system. 4,381,789, Cl. 128-798.000.

**National Research Development Corporation:** *See—*
Gosling, Harold W.; and King, Reginald A., 4,382,160, Cl. 179-15.55R.
Holland, Leslie A., 4,382,100, Cl. 427-38.000.

**NCR Corporation:** *See—*
Penton, Perry W., 4,382,179, Cl. 377-20.000.

**Neff, James A.,** to MAC Valves, Inc. Flow control valve with a non-rising stem. 4,381,797, Cl. 137-599.000.

**Nelson, Alfred M.:** *See—*
Rasekhi, Houshang; and Nelson, Alfred M., 4,381,966, Cl. 156-630.000.

**Nelson, Raymond A.:** *See—*
Graham, Donald E.; Nelson, Raymond A.; and Olive, Edmond E., 4,382,282, Cl. 364-434.000.

**Neufeld, Alonzo J.** Method and apparatus for performing percutaneous bone surgery and new pin implant. 4,381,770, Cl. 128-92.0BA.

**Neuzil, Richard W.:** *See—*
Kulprathipanja, Santi; and Neuzil, Richard W., 4,382,001, Cl. 210-674.000.

**Nevitt, Thomas D.,** to Standard Oil Company (Indiana). Process for treating hydrocarbon feedstocks with CO and $H_2O$ in the presence of steam stable catalysts. 4,381,993, Cl. 208-217.000.

**Newton, Robert P., III.** Tire mounting system. 4,381,671, Cl. 73-487.000.

**Nidola, Antonio:** *See—*
De Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N., 4,381,979, Cl. 204-98.000.

**Nienart, Louis F.:** *See—*
Dickson, James; Nienart, Louis F.; and Roth, David W. H., Jr., 4,381,943, Cl. 75-2.510.

**Nihon Dempa Kogyo Co., Ltd.:** *See—*
Yoda, Hiroshi, 4,382,204, Cl. 310-366.000.

**Nippon Electric Co., Ltd.:** *See—*
Kiyozuka, Noboru, 4,382,197, Cl. 307-470.000.
Nagata, Koichi, 4,382,256, Cl. 340-825.440.

**Nippon Gakki Seizo Kabushiki Kaisha:** *See—*
Oya, Akiyoshi, 4,381,689, Cl. 84-1.010.

**Nippon Pillar Packing Co., Ltd.:** *See—*
Ohgoshi, Yoshiaki, 4,381,867, Cl. 277-3.000.

**Nippon Soken, Inc.:** *See—*
Mizuno, Junzi; Takeuchi, Yukihisa; Fukami, Akira; Wakayama, Masao; and Tomita, Masahiro, 4,381,929, Cl. 55-316.000.
Morino, Seiji; Kawai, Hisasi; and Tokura, Norihito, 4,381,757, Cl. 123-606.000.
Yamamoto, Shinichi; Asano, Mitsuru; Suzuki, Zituo; and Ito, Toshihiko, 4,381,912, Cl. 425-461.000.

**Nippon Steel Corporation:** *See—*
Inoue, Akihiko; Inoue, Hirofumi; Nakamura, Tsuyoshi; Tobino, Seiji; and Baba, Masamitsu, 4,381,856, Cl. 266-281.000.

**Nippondenso Co., Ltd.:** *See—*
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Otsuki, Hiromi, 4,381,747, Cl. 123-339.000.
Kubo, Koji; Nishikawa, Mineo; and Sugi, Hikaru, 4,381,651, Cl. 62-296.000.

**Nishikawa, Mineo:** *See—*
Kubo, Koji; Nishikawa, Mineo; and Sugi, Hikaru, 4,381,651, Cl. 62-296.000.

**Nishikawa, Richard.** Appliance for removing the contents of bottles. 4,381,576, Cl. 15-236.00R.

Nishimura, Yutaka: *See*—
Sato, Kanemasa; Ueno, Sadayasu; Miya, Kazuhiko; Oyama, Yoshishige; and Nishimura, Yutaka, 4,381,668, Cl. 73-202.000.
Nissan Motor Company, Limited: *See*—
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Umezawa, Hidetugu; Gotoh, Miyuki; Tanaka, Shigenori; and Nakao, Masashi, 4,381,807, Cl. 139-452.000.
Nixdorf Computer Corporation: *See*—
Ranalli, Charles, 4,382,254, Cl. 340-744.000.
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tomonori, to Koa Oil Company, Limited. Process for producing mesocarbon microbeads of uniform particle-size distribution. 4,381,990, Cl. 208-39.000.
Noll, Charles G., to United McGill Corporation. Corona electrode apparatus. 4,381,927, Cl. 55-138.000.
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Furst, Jan, 4,381,723, Cl. 114-45.000.
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North American Philips Corporation: *See*—
Balas, Charles, Jr., 4,381,648, Cl. 60-517.000.
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Joyce, Robert H.; Black, David H. A.; and Plangger, Franz O., 4,382,296, Cl. 370-81.000.
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Schwan, Thomas J., 4,382,140, Cl. 544-242.000.
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Hellstrom, Eric; and Helm, Lennart, 4,381,580, Cl. 16-243.000.
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Johnson, Clyde V.; and Huijnen, Wilhelmus G. J., 4,381,873, Cl. 299-5.000.
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Kudo, Satoru; Ohkubo, Kiyokazu; and Nakayama, Hiroshi, 4,381,682, Cl. 74-476.000.
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Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,382,123, Cl. 521-27.000.
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Katz, Lawrence E.; Gay, Walter A.; and Rothgery, Eugene F., 4,382,087, Cl. 424-200.000.
Kircher, Morton S., 4,381,984, Cl. 204-258.000.
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Meitzner, Erich F.; and Oline, James A., 4,382,124, Cl. 521-38.000.
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Yamamoto, Kimiaki; and Koike, Takaharu, 4,381,883, Cl. 350-164.000.
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Koyanagi, Takuji; Ono, Nobuhiro; and Kitamura, Hiroyuki, 4,382,055, Cl. 264-133.000.
Opti Patent-, Forschungs- und Fabrikations-AG: *See*—
Griessbaum, Karl, 4,381,804, Cl. 139-384.00B.
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Tassara, Jean-Pierre, 4,382,004, Cl. 252-25.000.
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Kosuge, Yoshiaki; Yoshida, Ryo; Sumida, Seizo; Oshita, Hirofumi; Otsuki, Soji; and Kamoshita, Katsuzo, 4,381,935, Cl. 71-88.000.
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Frentzel, Kurt H.; and Oskam, Herman, 4,381,811, Cl. 160-168.00R.
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Otis Engineering Corporation: *See*—
Fisher, Ernest P., Jr., 4,381,822, Cl. 166-326.000.
Kyte, Louis D.; and Council, Malcolm N., 4,381,904, Cl. 417-287.000.
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Ott, Klaus: *See*—
Andrei-Alexandru, Marcel; Ott, Klaus; and Prohaska, Hans, 4,381,625, Cl. 49-280.000.
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Outboard Marine Corporation: *See*—
Brown, Peter W.; DuBois, Chester G.; and McChesney, Richard M., 4,382,047, Cl. 261-41.00D.
Walsworth, Frank J., 4,381,741, Cl. 123-73.0AD.
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Seng, Stephen, 4,382,050, Cl. 264-40.400.
Owens-Illinois, Inc.: *See*—
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Sato, Kanemasa; Ueno, Sadayasu; Miya, Kazuhiko; Oyama, Yoshishige; and Nishimura, Yutaka, 4,381,668, Cl. 73-202.000.
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Bessett, Clifford H.; and Misdom, Theodore H., 4,381,847, Cl. 229-2.50R.
Paget, G. Edward, to Monsanto Company. Separation of plasma proteins from cell culture systems. 4,382,028, Cl. 260-112.00B.
Pai, Stephen M., to Westinghouse Electric Corp. Remote device for a multi-phase power distribution network communication system. 4,382,248, Cl. 340-310.00A.
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Ekrud, Anders L.; and Pantzar, Glenn G. E., 4,381,606, Cl. 30-387.000.

Panzarella, James S., to Quaker Oats Company, The. Action device with confined action element. 4,381,620, Cl. 46-47.000.

Panzer, Klaus, to Siemens Aktiengesellschaft. Broad band switching system. 4,382,266, Cl. 358-86.000.

Paolino, Ralph J. Flue heat reclaimer. 4,381,819, Cl. 165-156.000.

Pape, Heinz: *See*—
Quella, Ferdinand; and Pape, Heinz, 4,382,272, Cl. 362-84.000.

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Romito, Vincent A.; and Bruso, Loran H., 4,382,063, Cl. 422-57.000.

Parker, Louis W.: *See*—
Hedges, Rhey W., 4,382,223, Cl. 323-242.000.

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Paschke, Edward E.; and Donohue, J. A., to Standard Oil Company (Indiana). Polyamide containing 4,4'-diamino-2,2', 6,6'-tetramethylbiphenyl moieties. 4,382,138, Cl. 528-347.000.

Pastusek, Paul E., to Reed Rock Bit Company. Drill bit lubrication system. 4,381,824, Cl. 175-229.000.

Patnaik, Birendra K.: *See*—
Allan, John L. H.; Patnaik, Birendra K.; and Agapiou, Agapios, 4,382,018, Cl. 252-429.00B.

Patton, John T., Jr.: *See*—
Narayan, Thirumurti; Kan, Peter T.; and Patton, John T., Jr., 4,382,125, Cl. 521-160.000.

Patz Company: *See*—
Patz, Paul; Patz, Howard G.; Cleven, Russell W.; and Hackbarth, James M., 4,381,733, Cl. 119-52.00B.
Patz, Paul; Patz, Howard G.; Cleven, Russell W.; and Hackbarth, James M., 4,381,734, Cl. 119-52.00B.

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Pauperas, Victor: *See*—
Power, John B.; Casale, Thomas M.; and Pauperas, Victor, 4,381,795, Cl. 137-240.000.

Pearsall, Thomas, to Thomson-CSF. Heterojunction semiconductor device. 4,382,265, Cl. 357-16.000.

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Armand, Marcel, 4,381,976, Cl. 204-64.00T.

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Pellico, Michael A., to Laclede Professional Products, Inc. Settable alginate compositions. 4,381,947, Cl. 106-38.50D.

Peltz, John R., to GTE Products Corporation. Signal indicating fuse testing apparatus. 4,382,225, Cl. 324-73.00R.

Peltzer, Bernd: *See*—
Hohlein, Peter; Uerdingen, Walter; Peltzer, Bernd; and Mennicken, Gerhard, 4,382,114, Cl. 428-423.100.

Penton, Perry W., to NCR Corporation. Address range timer/counter. 4,382,179, Cl. 377-20.000.

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Carver, George P.; Heap, Michael P.; Martin, G. Blair; Pershing, David W.; Rees, Dee P.; and Zallen, Dennis M., 4,381,718, Cl. 110-347.000.

Peter, Cornelius: *See*—
Eckert, Konrad; Muller, Klaus; Linder, Ernst; Maurer, Helmut; Rieger, Franz; Moser, Winfried; Franke, Horst; Burkel, Rainer; and Peter, Cornelius, 4,381,748, Cl. 123-414.000.

Peters, Jurgen: *See*—
Maisch, Wolfgang; Peters, Jurgen; Wissmann, Michael; Gmelin, Karl; and Stiefel, Peter, 4,381,751, Cl. 123-454.000.

Peters, Klaus-Jurgen; Stiefel, Peter; and Ehrentraut, Heinz, to Robert Bosch GmbH. Differential pressure valve for a fuel injection system. 4,381,997, Cl. 210-352.000.

Peters, Roger L. Method and apparatus for determining the number of seeds per unit weight in a seed sample. 4,381,669, Cl. 73-432.0PS.

Petersen, Hans C., to Danfoss A/S. Hydraulic torque amplifier, particularly for steering devices. 4,381,905, Cl. 418-61.00B.

Pfeiffer, Jurgen: *See*—
Bischlipp, Klaus; Pfeiffer, Jurgen; and Kannert, Paul, 4,381,907, Cl. 425-110.000.

Pfizer Inc.: *See*—
Sciavolino, Frank C.; and Guadliana, Mark A., 4,382,085, Cl. 424-180.000.
Sciavolino, Frank C.; and Hauske, James R., 4,382,086, Cl. 424-180.000.

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Funk, Gary L., 4,381,814, Cl. 165-1.000.
McDaniel, Max P., 4,382,022, Cl. 252-452.000.
Wishman, Marvin, 4,381,611, Cl. 34-9.000.
Wood, William E.; and MacQueen, Donald K., 4,381,992, Cl. 208-179.000.

Philp, John: *See*—
Gratzel, Michael; Kiwi, John; Kalyanasundaram, Kuppuswamy; and Philp, John, 4,381,978, Cl. 204-75.000.

Piatti, Giovanni; and Pellegrini, Giovanni, to F. L. Smidth & Co. Method of increasing the ductility of articles formed from superplastic alloy and article. 4,381,954, Cl. 148-2.000.

Pichler, Marty A.: *See*—
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,381,977, Cl. 204-74.000.

Pierce, Zona R.; and Frank, David S., to Eastman Kodak Company. Element, structure and method for the analysis or transport of liquids. 4,381,921, Cl. 436-535.000.

PIFCO Limited: *See*—
Wood, Paul A. P., 4,382,176, Cl. 219-494.000.

Pinter, Warren H.; and Blaney, David H., to United Technologies Corporation. Method of manufacturing a filament wound article. 4,381,960, Cl. 156-175.000.

Pioch, Richard P., to Eli Lilly and Company. N-Thiazolylmethylthioalkyl-N'alkylamidines and related compounds. 4,382,090, Cl. 424-270.000.

Place, Christopher L. Carpenter's tool. 4,381,607, Cl. 33-1.00G.

Plangger, Franz O.: *See*—
Joyce, Robert H.; Black, David H. A.; and Plangger, Franz O., 4,382,296, Cl. 370-81.000.

Ploix, Jean L.: *See*—
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Poehlmann, Peter: *See*—
Arbeletche, Carlos; Boelcke, Ingo; Poehlmann, Peter; and Kirchner, Klaus, 4,381,897, Cl. 406-93.000.

Pohl, Gunter; and Mundel, Gerald, to Siemens Aktiengesellschaft. Monolithically integrable semiconductor circuit. 4,382,195, Cl. 307-280.000.

Pohl, Karl-Heinz, to Siemon Company, The. Multiple electrical connector and block. 4,381,880, Cl. 339-97.00P.

Pohl, Ludwig: *See*—
Eidenschink, Rudolf; and Pohl, Ludwig, 4,382,012, Cl. 252-299.100.

Polak, Anthony J., to UOP Inc. Method for increasing the peel strength of metal-clad polymers. 4,382,101, Cl. 427-40.000.

Polak's Frutal Works B.V.: *See*—
Berkhoff, Hendrik J.; and Zagt, Rudolf, 4,382,078, Cl. 424-45.000.

Polaroid Corporation: *See*—
Borror, Alan L.; and Ellis, Ernest W., 4,382,119, Cl. 430-212.000.

Ponsford, Roger J.; and Howarth, Thomas T., to Beecham Group Limited. Antibiotics. 4,382,084, Cl. 424-114.000.

Ponzo, John L.: *See*—
Liao, John C.; Ponzo, John L.; and Jenning, Ellen M., 4,382,075, Cl. 424-3.000.

Potter, Shirley L. Wind powered electricity generation system. 4,382,191, Cl. 290-55.000.

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Aberson, Gerard M.; and Powell-Toothman, Robin, 4,381,784, Cl. 605-368.000.

Power, John B.; Casale, Thomas M.; and Pauperas, Victor, to Dayco Corporation. Diverter valve construction and method of making same. 4,381,795, Cl. 137-240.000.

PPG Industries, Inc.: *See*—
Korach, Malcolm, 4,381,983, Cl. 204-252.000.
Kunkle, Gerald E.; and Matesa, Joseph M., 4,381,934, Cl. 65-135.000.
Schultz, Stephen J.; and Wolfe, Terry L., 4,381,933, Cl. 65-106.000.

Prahl, Jan, to IPOS Gesellschaft fur integrierte Prothesen-Entwicklung und orthopadietechnischen Service mbH & Co. KG. Protective element for producing the closure edges of plaster bandages on the human body, and a plaster bandage made using such protective member. 4,381,769, Cl. 128-91.00R.

Preston, Bruce S.: *See*—
Davidson, Ronnie D.; and Preston, Bruce S., 4,382,270, Cl. 361-115.000.

Pretini, Gisberto. Secured automated banking facilities. 4,382,255, Cl. 340-825.310.

Primbsch, Erik: *See*—
Kaule, Walter; and Primbsch, Erik, 4,381,676, Cl. 73-657.000.

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Gogol, Carl A., Jr.; and Prince, Eric T., 4,381,894, Cl. 356-72.000.

Printing Machinery & Electronics, Inc.: *See*—
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Prohaska, Hans: *See*—
Andrei-Alexandru, Marcel; Ott, Klaus; and Prohaska, Hans, 4,381,625, Cl. 49-280.000.

Puhaczewski, Paul R.: *See*—
Hamilton, C. Howard; and Puhaczewski, Paul R., 4,381,657, Cl. 72-60.000.

Pujari, Vimal K.: *See*—
Frost, Rodney I.; McBrayer, Robert D.; and Pujari, Vimal K., 4,381,815, Cl. 165-10.000.

Punter, Hendrik; and Wagenaar, Kornelis J., to U.S. Philips Corporation. Method of diffusing aluminum. 4,381,957, Cl. 148-188.000.

Putnam, Milton T., to United Recording Electronic Industries. High frequency horn. 4,381,831, Cl. 181-152.000.

Quaker Oats Company, The: *See*—
Kottke, Roger H., 4,381,813, Cl. 164-527.000.
Krisel, Elisabeth, 4,381,618, Cl. 46-22.000.
Panzarella, James S., 4,381,620, Cl. 46-47.000.

Quantic Industries, Inc.: *See*—
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Quarendon, Peter: *See*—
Mitchell, Joan L.; and Quarendon, Peter, 4,382,286, Cl. 364-900.000.

Quella, Ferdinand; and Pape, Heinz, to Siemens Aktiengesellschaft. Colored lamp. 4,382,272, Cl. 362-84.000.
Quirin, William: *See—*
Mandel, Evan W.; and Quirin, William, 4,382,280, Cl. 364-412.000.
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N. Weld deposition of metal other than aluminium onto aluminium-base alloy. 4,382,169, Cl. 219-76.100.
Radaelli, Dario, to Alfa Romeo S.p.A. Nonlinear digital transducer based on the Gray's encoding. 4,382,250, Cl. 340-347.00P.
Radio Materials Corporation: *See—*
Tribby, Charles T.; Clawson, Arthur H., Jr.; and Clawson, Charles D., 4,382,203, Cl. 310-355.000.
Radtke, Robert P., to Strata Bit Corporation. Drill bit nozzle. 4,381,825, Cl. 175-393.000.
Ramstrom, Olle: *See—*
Schwartz, Stephan; Ramstrom, Olle; and Bjareklint, Ake, 4,382,113, Cl. 428-408.000.
Ranalli, Charles, to Nixdorf Computer Corporation. Video display control circuitry. 4,382,254, Cl. 340-744.000.
Ranghelli, Joseph C., to International Telephone and Telegraph Corporation. Two channel transmit only antenna. 4,382,260, Cl. 343-750.000.
Rank Xerox Limited: *See—*
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Ransom, Maurice N.: *See—*
Beuscher, Hugo J.; and Ransom, Maurice N., 4,382,294, Cl. 370-16.000.
Rasekhi, Houshang; and Nelson, Alfred M., to Wang Laboratories, Inc. Process for fabricating recording heads for magnetography. 4,381,966, Cl. 156-630.000.
Rauch, Jean, to Automobiles Peugeot; and Automobiles Citroen. Exhaust silencer having an incorporated resonator for an internal combustion engine. 4,381,832, Cl. 181-266.000.
Ravalitera, Guy: *See—*
Thery, Pierre; Ravalitera, Guy; and Cornet, Michel, 4,382,154, Cl. 136-206.000.
RCA Corporation: *See—*
Angle, Rodney L., 4,382,267, Cl. 358-213.000.
Dieterich, Charles B., 4,382,299, Cl. 371-8.000.
Inacker, Henry F.; and Henderson, Elmer L., 4,382,237, Cl. 333-24.100.
Lock, Brian E., 4,381,964, Cl. 156-344.000.
Mendelson, Robert M., 4,382,192, Cl. 307-141.400.
Rosen, Arye, 4,381,952, Cl. 148-1.500.
Taylor, Byron K., 4,382,292, Cl. 369-43.000.
Record Industrial Company: *See—*
Kress, Robert R., 4,381,639, Cl. 57-229.000.
Red Lodge Manufacturing Co.: *See—*
Courtis, Thomas M.; and Donelson, Carl E., 4,381,626, Cl. 49-385.000.
Reed Rock Bit Company: *See—*
Pastusek, Paul E., 4,381,824, Cl. 175-229.000.
Rees, Dee P.: *See—*
Carver, George P.; Heap, Michael P.; Martin, G. Blair; Pershing, David W.; Rees, Dee P.; and Zallen, Dennis M., 4,381,718, Cl. 110-347.000.
Regan, Michael T., to Eastman Kodak Company. Novel phthalocyanine pigments. 4,382,033, Cl. 260-245.740.
Reges, James C. Fireplace insert with forced air flow heat exchanger. 4,381,760, Cl. 126-123.000.
Regie Nationale des Usines Renault: *See—*
Lombard, Claude, 4,381,679, Cl. 73-861.050.
Maistrelli, Roger, 4,381,701, Cl. 91-499.000.
Montaron, Bernard, 4,381,829, Cl. 180-274.000.
Reichhold Chemicals, Incorporated: *See—*
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Reynolds, William R. Battery charger for a backup power circuit. 4,382,221, Cl. 320-35.000.
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Robinson, Charles A.; and Robinson, Barnett J. Means and method for providing a non-freezing catalyst solution. 4,382,017, Cl. 252-429.00R.
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Rosen, Arye, to RCA Corporation. Method for fabricating a low loss varactor diode. 4,381,952, Cl. 148-1.500.
Rosenberg, Harold; and Tsai, Tsu-tzu, to United States of America, Air Force. Synthesis of arylene bis-silanols. 4,382,144, Cl. 556-440.000.
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Roth, Manfred, to Werkzeugbau Wolfgruben GmbH. Mold apparatus for forming profile employing reinforcing preform. 4,381,908, Cl. 425-129.00R.
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Rowan, James P. Actuators for small sailing craft. 4,381,725, Cl. 114-126.000.
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Rudolph, Udo; Schmidt, Manfred; Freitag, Dieter; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Process for the production of aromatic carboxylic acid chlorides. 4,382,041, Cl. 260-544.00D.
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Ruseff, Walter Z.; and Schimpf, James E., to Caterpillar Tractor Co. Torque and high pressure limiting control for variable displacement pumps. 4,381,646, Cl. 60-452.000.
Ruseff, Walter Z., to Caterpillar Tractor Co. Load-plus valve for variable displacement pumps. 4,381,647, Cl. 60-452.000.
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Ryan, John P., to Industrial Machine Works, Inc. Technique for conserving hot metal temperature. 4,381,855, Cl. 266-248.000.
Ryder, George A., Jr., to Innova, Inc. Membrane construction. 4,381,985, Cl. 204-296.000.
S. A. Texaco Belgium N.V.: *See—*
Maes, Jean P., 4,381,981, Cl. 204-197.000.
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Sabine, Percy V. H., to Australian Telecommunications Commission. Fibre optic termination. 4,381,882, Cl. 350-96.200.
Sachar, Kenneth S.; and Silvestri, Victor J., to International Business Machines Corporation. Porous film heat transfer. 4,381,818, Cl. 165-133.000.
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Sakai, Shizuyoshi; Fujinami, Tatsuo; Kosugi, Kunio; Takemura, Hiroshi; and Sagesaka, Michiaki, to Shizuoka University, The President of. Process for producing a polyether carbonate surface active material. 4,382,014, Cl. 252-356.000.
Sallay, Stephen I. Ammoniumtriborate, an effective new flame retardant. 4,382,025, Cl. 252-607.000.
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Sapp, Dennis H., to Research-Cottrell, Inc. Framework structure. 4,381,636, Cl. 52-648.000.
Sargenti, Angelo, to Micro-Mega S.A. Guide accessory for a drill mounted on dental hand-tool. 4,381,917, Cl. 433-114.000.
Sarma, Kalluri R.: *See—*
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Sato, Akira; and Waki, Tatsuo, to Lonseal Corporation. Method for producing an open cell foam from a polyvinyl chloride resin produced by suspension polymerization. 4,381,962, Cl. 156-244.110.
Sato, Kanemasa; Ueno, Sadayasu; Miya, Kazuhiko; Oyama, Yoshishige; and Nishimura, Yutaka, to Hitachi, Ltd. Gas flow measuring apparatus. 4,381,668, Cl. 73-202.000.
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Sato, Yoshimi; Hiraiwa, Nobuo; and Hasegawa, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Changeover valve unit for power-assisted steering systems. 4,381,799, Cl. 137-625.680.
Sato, Yoshimi: *See—*
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Savit, Joseph. Multicolor jet printing. 4,382,262, Cl. 346-1.100.
Saxer, Norman K. Internally illuminated rotatable pictorial menu display. 4,381,616, Cl. 40-502.000.
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Schlaufman, Robert J.: *See—*
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Schlottman, Glen N. Self propelled reaching-type mobile loader. 4,381,900, Cl. 414-718.000.
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Schmidt, Manfred: *See—*
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Schmitt, Rupert: *See*—
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Schneider, Charles. Sofa-bed. 4,381,570, Cl. 5-13.000.

Schneider, Hatto G. A., to Carl Schenck AG. Support system for hard bearing balancing machines. 4,381,670, Cl. 73-471.000.

Schreiber, Friedrich; and Kirchner, Horst, to Braun Aktiengesellschaft. Dry shaver. 4,381,603, Cl. 30-43.920.

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Schultz, Stephen J.; and Wolfe, Terry L., to PPG Industries, Inc. Method and apparatus for shaping moving glass sheets by sagging followed by roll pressing. 4,381,933, Cl. 65-106.000.

Schulz, Johann G.; Barie, Walter P., Jr.; and Eurich, James T., to Gulf Research & Development Company. Molded resin product and process for producing same. 4,382,137, Cl. 527-500.000.

Schulz, Johann G. D., to Gulf Research & Development Company. Organic acids and process for preparing same. 4,382,146, Cl. 562-410.000.

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Schwan, Thomas J., to Norwich Eaton Pharmaceuticals, Inc. 2,4-Diphenyl-5-pyrimidinecarbonitrile. 4,382,140, Cl. 544-242.000.

Schwartz, Stephan; Ramstrom, Olle; and Bjareklint, Ake, to Energy Development Associates, Inc. Method for joining graphite to graphite. 4,382,113, Cl. 428-408.000.

Schwarz, Howard H., to Contour Packaging Corporation. Interlocking arrangement for plastic containers. 4,381,841, Cl. 220-23.400.

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Sciaraffa, Michael A.; and Boland, Leona G., to Kimberly-Clark Corporation. Flexible waist diaper. 4,381,781, Cl. 604-372.000.

Sciavolino, Frank C.; and Guadliana, Mark A., to Pfizer Inc. 4"-Epi erythromycin A and derivatives thereof as useful antibacterial agents. 4,382,085, Cl. 424-180.000.

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Seitz-Werke GmbH: *See*—
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
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Selover, Theodore B., Jr.; and Hacha, Thomas H., to Standard Oil Company, The. Process for forming a swaged seal for fused salt batteries. 4,381,597, Cl. 29-623.200.

Seng, Stephen, to Owens-Corning Fiberglas Corporation. Method for handling heat-softenable batch material. 4,382,050, Cl. 264-40.400.

Serlin, Irving; and Gardner, Donald M., to Monsanto Company. Electrographic recording material. 4,382,107, Cl. 428-212.000.

Shade, Floyd J.: *See*—
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Shaffer, Donald J. Engine with additional shared flow control runner for two cylinders. 4,381,738, Cl. 123-52.00M.

Shah, Hasmukh R.; and Gupta, Ashok K., to UMC Industries, Inc. Control device. 4,381,835, Cl. 194-1.00N.

Shah, Ramesh B.: *See*—
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Shank, Samuel E., to Wangner Systems, Inc. Dryer fabric for papermaking machine and method. 4,381,612, Cl. 34-116.000.

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Shelby, Carroll: *See*—
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Shell Oil Company: *See*—
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Drent, Eit, 4,382,148, Cl. 568-462.000.

Shepherd Products Limited: *See*—
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Shepherd, Robert G., to American Cyanamid Company. Hypolipidemic and antisthenosclerotic novel (monosubstituted-amino)-heteroaryl carboxylic acids and analogs. 4,382,143, Cl. 549-68.000.

Sherman, Yakov I.: *See*—
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Shiba, Tetsuo; Yamamura, Yuichi; Kotani, Shozo; Nagase, Osamu; and Ogawa, Hidemasa, to Daiichi Seiyaku Co., Ltd. Method for treating and preventing bacterial infections. 4,382,080, Cl. 424-177.000.

Shifflet, Glenn W., to International Control Systems, Inc. Simulated noise generator. 4,382,235, Cl. 331-127.000.

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Shimano Industrial Company Limited: *See*—
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Shimizu, Yasumasa: *See*—
Kitamura, Hirotsugu; Shimizu, Yasumasa; and Ohura, Osami, 4,382,147, Cl. 568-33.000.

Shioiri, Takefumi: *See*—
Tajima, Osamu; and Shioiri, Takefumi, 4,382,293, Cl. 369-43.000.

Shiota, Takeshi, to St Lab., Inc. Mass flow meter. 4,381,680, Cl. 73-861.380.

Shiraki, Manabu: *See*—
Ban, Itsuki; and Shiraki, Manabu, 4,382,214, Cl. 318-254.000.

Shiurila, John, to Centronics Data Computer Corporation. Print head mounting assembly with form adjustment. 4,381,896, Cl. 400-56.000.

Shizuoka University, The President of: *See*—
Sakai, Shizuyoshi; Fujinami, Tatsuo; Kosugi, Kunio; Takemura, Hiroshi; and Sagesaka, Michiaki, 4,382,014, Cl. 252-356.000.

Shupe, David M.: *See*—
O'Connor, James M.; and Shupe, David M., 4,381,672, Cl. 73-505.000.

Siemens Aktiengesellschaft: *See*—
Grueter, Otto, 4,382,193, Cl. 307-221.00D.
Lechner, Ernst-Friedrich; and Meusel, Otto, 4,381,878, Cl. 339-14.00R.
Naser, Georg; Strahwald, Franz; and Szehi, Erich, 4,381,789, Cl. 128-798.000.
Panzer, Klaus, 4,382,266, Cl. 358-86.000.
Pohl, Gunter; and Mundel, Gerald, 4,382,195, Cl. 307-280.000.
Quella, Ferdinand; and Pape, Heinz, 4,382,272, Cl. 362-84.000.
Thormann, Harald; Gose, Horst; and Weser, Arnold, 4,381,608, Cl. 33-1.00M.

Siemon Company, The: *See*—
Pohl, Karl-Heinz, 4,381,880, Cl. 339-97.00P.

Sigma-TAU Industrie Farmaceutiche Riunite S.p.A.: *See*—
Cavazza, Claudio, 4,382,092, Cl. 424-316.000.

Silverberg, Morton, to Xerox Corporation. Paddle wheel retard feeder. 4,381,860, Cl. 271-10.000.

Silverberg, Morton, to Xerox Corporation. Recirculating document lateral registration. 4,381,893, Cl. 355-3.0SH.

Silverman, Peter J., to Intel Magnetics, Inc. Thin film magnetic bubble detector. 4,382,288, Cl. 365-8.000.

Silvestri, Victor J.: *See*—
Sachar, Kenneth S.; and Silvestri, Victor J., 4,381,818, Cl. 165-133.000.

Simo, Miroslav A. Arrowhead with removable blades. 4,381,866, Cl. 273-422.000.

Simon, Richard L.: *See*—
Lacefield, William B.; and Simon, Richard L., 4,382,093, Cl. 424-324.000.

Simonton, Robert D.; and Schultz, Carl D., to Mac Engineering & Equip. Co., Inc. Method and apparatus for battery plate stacking. 4,381,596, Cl. 29-623.100.

Singer Company, The: *See*—
Dicke, William C., 4,381,628, Cl. 51-170.0TL.

Singh, Krishna P.: *See*—
Holtz, Maurice; and Singh, Krishna P., 4,382,060, Cl. 376-272.000.

Singh, Raj N., to General Electric Company. Etched beta"-alumina ceramic electrolyte. 4,381,968, Cl. 156-663.000.

Sinka, Joseph V.; Higbie, Francis A.; and LieBerman, Robert A., to Diamond Shamrock Corporation. Radiation-hardenable diluents. 4,382,135, Cl. 526-301.000.

SITMA - Societa Italiana Macchine Automatiche S.p.A.: *See*—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,381,637, Cl. 53-51.000.

Sloboth, Thomas A.: *See*—
Goodnow, Robert A.; Shade, Floyd J.; Sloboth, Thomas A.; and Kaye, Donald J., 4,381,773, Cl. 128-200.140.
Smarte Carte, Inc.: *See*—
Muellner, James M., 4,381,870, Cl. 280-33.99B.
Smirnov, Vitaly K.: *See*—
Kugushin, Alexandr A.; Bespalov, Vladimir N.; Labetsky, Jury O.; Druzin, Vyacheslav I.; Smirnov, Vitaly K.; and Shilov, Vladislav A., 4,381,658, Cl. 72-234.000.
Smith, Murray S., Jr.; Hilboldt, Mark S.; and Bhat, Thirmaleshwara A., to General Electric Company. Superalloy article repair method and alloy powder mixture. 4,381,944, Cl. 75-255.000.
Smith, Russell D.; and Tressler, Richard E., to Kennecott Corporation. Method for coating alumina containing refractory fibers with chromium oxide. 4,382,104, Cl. 427-226.000.
SmithKline Beckman Corporation: *See*—
Holden, Kenneth G.; Kaiser, Carl; and Weinstock, Joseph, 4,382,029, Cl. 260-239.0BB.
SmithKline Instruments, Inc.: *See*—
Detweiler, Michael B.; Lawrence, Paul J.; and Townsley, Charles W., 4,382,064, Cl. 422-58.000.
Smock, Alan L.: *See*—
Colvin, Jack A.; Hellmann, John V.; and Smock, Alan L., 4,382,242, Cl. 335-202.000.
Socapex: *See*—
Villemont, Claude M.; Bricaud, Herve G. P. M.; and Hamaide, Pierre, 4,382,271, Cl. 361-386.000.
Societe Anonyme des Etablissements Adrien De Backer: *See*—
De Backer, Jean A.; and Yperman, Jacques L., 4,382,274, Cl. 362-153.000.
Societe Anonyme dite: L'Oreal: *See*—
Jacquet, Bernard; and Lang, Gerard, 4,381,919, Cl. 8-405.000.
Societe Cefilac, Joints Fargere: *See*—
Abbes, Claude; Martinez, Fernando; and Rouaud, Christian, 4,381,869, Cl. 277-236.000.
Solo, Charles P. Instant truss roof support system. 4,381,635, Cl. 52-639.000.
Someya, Hiromi, to Canon Kabushiki Kaisha. Waist level viewfinder. 4,381,892, Cl. 354-287.000.
Speer, William B.: *See*—
Welch, Mack D.; and Speer, William B., 4,381,659, Cl. 72-340.000.
Sperry Corporation: *See*—
Cortner, Joseph M., 4,382,257, Cl. 340-825.870.
Graham, Donald E.; Nelson, Raymond A.; and Olive, Edmond E., 4,382,282, Cl. 364-434.000.
Spidell, Vernon B., to Kaufman, Alan L. Lawn edge construction and method. 4,381,622, Cl. 47-33.000.
Spiro Research B.V.: *See*—
Roffelsen, Franciscus, 4,381,928, Cl. 55-170.000.
Spitschan, Hans J.: *See*—
Heine, Helmut A.; Schmidt, Otto H.; and Spitschan, Hans J., 4,382,219, Cl. 320-2.000.
Spitzenberger, Kurt: *See*—
Stecher, Gunther; Spitzenberger, Kurt; and Muller, Klaus, 4,382,247, Cl. 338-42.000.
Springer, William E.; and Kurtz, Stewart K., to Clairol Incorporated. Roller clip. 4,381,790, Cl. 132-37.00R.
St Lab., Inc.: *See*—
Shiota, Takeshi, 4,381,680, Cl. 73-861.380.
Stainless Mfg., Inc.: *See*—
Erichsen, Charles W.; and Bleemers, Michael A., 4,381,768, Cl. 128-80.00C.
Stamicarbon, B.V.: *See*—
van de Leemput, Lambertus J. M. A.; Nooijen, Godefridus A. H.; and van der Loo, Hendrikus W., 4,382,020, Cl. 252-432.000.
Stampiton Group of Companies Limited, The: *See*—
Hardy, Philip M., 4,381,688, Cl. 83-887.000.
Standard Oil Company, The: *See*—
Gaylor, V. Frances; Greene, Janice L.; Miller, Arthur F.; and Pichler, Marty A., 4,381,977, Cl. 204-74.000.
Li, George S., 4,382,128, Cl. 524-513.000.
Selover, Theodore B., Jr.; and Hacha, Thomas H., 4,381,597, Cl. 29-623.200.
Standard Oil Company (Indiana): *See*—
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,381,991, Cl. 208-113.000.
Nevitt, Thomas D., 4,381,993, Cl. 208-217.000.
Paschke, Edward E.; and Donohue, J. A., 4,382,138, Cl. 528-347.000.
Stark, Forest G., to American Locker Security Systems, Inc. Hinge mechanism for door of a coin operated locker cabinet. 4,381,877, Cl. 312-138.00R.
Stark, Terrence L., to General Motors Corporation. Diesel exhaust cleaner and burner system with constant burner air mixture supply. 4,381,643, Cl. 60-303.000.
Stauffer Chemical Company: *See*—
Greco, Carl C., 4,382,019, Cl. 252-429.00B.
Hardy, Thomas A.; and Jaffe, Fred, 4,382,042, Cl. 260-980.000.
Hyzak, Daniel L., 4,381,936, Cl. 71-100.000.
Stawitz, Josef: *See*—
Reubke, Karl-Julius; and Stawitz, Josef, 4,382,034, Cl. 260-367.000.
Stecher, Gunther; Spitzenberger, Kurt; and Muller, Klaus, to Robert Bosch GmbH. Pressure sensor. 4,382,247, Cl. 338-42.000.
Stein, Jeffrey D.: *See*—
Saer, George A.; and Stein, Jeffrey D., 4,382,161, Cl. 179-81.00C.
Steinmetz, George H.: *See*—
Crimmins, Darrell B.; and Steinmetz, George H., 4,381,703, Cl. 99-516.000.
Stephen Laurie Manufacturing Company, Inc.: *See*—
Cichonski, Walter E., 4,381,627, Cl. 49-453.000.
Sterling Drug Inc.: *See*—
Margulies, Herman, 4,381,779, Cl. 604-202.000.
Stiefel, Peter: *See*—
Maisch, Wolfgang; Peters, Jurgen; Wissmann, Michael; Gmelin, Karl; and Stiefel, Peter, 4,381,751, Cl. 123-454.000.
Peters, Klaus-Jurgen; Stiefel, Peter; and Ehrentraut, Heinz, 4,381,997, Cl. 210-352.000.
Stimac, John F.; and Goulet, Paul E., to Industrial Metal Fabricators Co. Industrial washer structure. 4,381,794, Cl. 134-67.000.
Stockli, Andre; and Desmarais, Gilles, to Stockli, Andre. Automatic pressure valve. 4,381,796, Cl. 137-596.200.
Stog, Wilhelm, to WSW-Planungs-GmbH. Coke-oven door. 4,381,972, Cl. 202-248.000.
Stolk, Steven A.: *See*—
Daenen, Theo E. G.; van Dijk, Gerardus A. R.; and Stolk, Steven A., 4,381,975, Cl. 204-14.00N.
Stork Screens B.V.: *See*—
van der Velden, Hendricus H., 4,381,961, Cl. 156-215.000.
Strader, Don S., to Motor Wheel Corporation. Wheel spindle retention for a non-driven vehicle wheel. 4,381,874, Cl. 301-125.000.
Strahwald, Franz: *See*—
Naser, Georg; Strahwald, Franz; and Szehi, Erich, 4,381,789, Cl. 128-798.000.
Strata Bit Corporation: *See*—
Radtke, Robert P., 4,381,825, Cl. 175-393.000.
Stratford Manufacturing, Inc.: *See*—
McVey, Charles W., 4,382,218, Cl. 318-812.000.
Street, Lawrence M. Stirrer motor support. 4,382,200, Cl. 310-157.000.
Stretovich, Anatoly D.: *See*—
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N., 4,382,169, Cl. 219-76.100.
Strok, Jack M., Jr., to General Electric Company. Metal vapor arc lamp having thermal link diminishable in heat conduction. 4,382,205, Cl. 313-25.000.
Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Magnetic bearing and motor. 4,381,875, Cl. 308-10.000.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Nonnenmann, Manfred; Oltmanns, Heinrich; and Hohhausel, Manfred, 4,381,590, Cl. 29-157.00R.
Suga, Shigeru. Electrolytic cell for actinometers. 4,382,226, Cl. 324-94.000.
Sugi, Hikaru: *See*—
Kubo, Koji; Nishikawa, Mineo; and Sugi, Hikaru, 4,381,651, Cl. 62-296.000.
Sugiyama, Keiichi, to Yamaha Hatsudoki Kabushiki Kaisha. Intake device for engine. 4,381,749, Cl. 123-432.000.
Sulzer Brothers Limited: *See*—
Brunner, Alfred, 4,381,735, Cl. 122-510.000.
Brunner, Alfred, 4,381,801, Cl. 138-148.000.
Sumida, Seizo: *See*—
Kosuge, Yoshiaki; Yoshida, Ryo; Sumida, Seizo; Oshita, Hirofumi; Otsuki, Soji; and Kamoshita, Katsuzo, 4,381,935, Cl. 71-88.000.
Sumitomo Chemical Company, Limited: *See*—
Ito, Naoya; Yoshida, Takeshi; Aoki, Masahiro; Okubo, Masao; and Miki, Masayoshi, 4,381,941, Cl. 75-130.500.
Kosuge, Yoshiaki; Yoshida, Ryo; Sumida, Seizo; Oshita, Hirofumi; Otsuki, Soji; and Kamoshita, Katsuzo, 4,381,935, Cl. 71-88.000.
Shiga, Akinobu; Kakugo, Masahiro; Yamada, Koji; and Sadatoshi, Hajime, 4,382,065, Cl. 422-147.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Arimatsu, Toshio, 4,382,052, Cl. 264-85.000.
Sumner, Terence E.; Ward, James; and Wilson, Alan L., to Motorola, Inc. Filter for binary data with integral output amplitude multiplier. 4,382,285, Cl. 364-724.000.
Sunada, Tomonori: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tomonori, 4,381,990, Cl. 208-39.000.
Sundeen, Joseph E.; and Dejneka, Tamara, to E. R. Squibb & Sons, Inc. Inhibitors of mammalian collagenase. 4,382,081, Cl. 424-177.000.
Sundstrand Corporation: *See*—
Glennon, Timothy F., 4,382,275, Cl. 363-41.000.
Myers, H. Allen, 4,381,702, Cl. 91-506.000.
Suzuki, Hirosuke, to Junkosha Co., Ltd. Strip line cable using a porous, crystalline polymer dielectric tape. 4,382,236, Cl. 333-1.000.
Suzuki, Takeshi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Ohgoh, Toshiharu; Murakami, Manabu; Oketani, Kiyoshi; and Fujisaki, Hideaki, 4,382,151, Cl. 568-875.000.
Suzuki, Zituo: *See*—
Yamamoto, Shinichi; Asano, Mitsuru; Suzuki, Zituo; and Ito, Toshihiko, 4,381,912, Cl. 425-461.000.
Svekis, James J.; and Janez, John, to Shepherd Products Limited. Ignitor chamber for gas grill. 4,381,758, Cl. 126-41.00R.
Swanson, Wilbur M., to Washington University. Fluid oscillation materials testing apparatus and methods. 4,381,663, Cl. 73-37.000.

Swift & Company: *See*—
Bolin, Hubert; Bacus, James N.; and Barhaug, Ronald O., 4,382,098, Cl. 426-646.000.
Swift, Harold E.: *See*—
Madgavkar, Ajay M.; and Swift, Harold E., 4,381,641, Cl. 60-39.060.
Syntex (U.S.A.) Inc.: *See*—
Benjamin, Eric J.; Lee, Maryann O.; and Lin, Lih-Yang, 4,382,091, Cl. 424-273.00R.
System Development Corp.: *See*—
Glaser, Edward L.; and Galie, Louis M., 4,382,277, Cl. 364-200.000.
Szehi, Erich: *See*—
Naser, Georg; Strahwald, Franz; and Szehi, Erich, 4,381,789, Cl. 128-798.000.
Tabourier, Remy, to Thomson-CSF. Airborne frequency-modulation radar and its application to a missile homing head. 4,382,258, Cl. 343-17.20R.
Tajima, Osamu; and Shioiri, Takefumi, to Victor Company of Japan, Ltd. Signal pickup device in rotary recording medium reproducing apparatus. 4,382,293, Cl. 369-43.000.
Takada, Yuji: *See*—
Ohashi, Hiroshi; and Takada, Yuji, 4,382,252, Cl. 340-562.000.
Takagi, Toshinori; Nakata, Shinsaku; Kanki, Kazuhiko; and Hotta, Masahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Magnetic recording medium. 4,382,110, Cl. 428-336.000.
Takahashi, Minoru: *See*—
Matsumoto, Hideo; Takahashi, Minoru; and Kato, Marehito, 4,381,910, Cl. 425-398.000.
Takahashi, Shigeyuki, to Daicel Chemical Industries, Ltd. Film coated with solution containing a vinylidene chloride copolymer and surface active agent. 4,382,115, Cl. 428-424.600.
Takasugi, Tsuneji; and Umezawa, Seiji, to Citizen Watch Co., Ltd. Method for fabricating a watch case. 4,382,172, Cl. 219-137.00R.
Takatori, Kichitaro; Yamaguchi, Takashi; and Nagakura, Masahiko, to Kowa Co., Ltd. Thiadiazole derivatives and process for preparing same. 4,382,142, Cl. 548-139.000.
Takeda Chemical Industries, Ltd.: *See*—
Nose', Yukihiko; and Malchesky, Paul S., 4,381,775, Cl. 604-6.000.
Takeda, Nobumi, to Shimano Industrial Company Limited. Pedal for bicycle. 4,381,683, Cl. 74-594.600.
Takematsu, Yoshiyuki, to Fuji Koeki Corporation. Electric flash device. 4,382,211, Cl. 315-151.000.
Takemura, Hiroshi: *See*—
Sakai, Shizuyoshi; Fujinami, Tatsuo; Kosugi, Kunio; Takemura, Hiroshi; and Sagesaka, Michiaki, 4,382,014, Cl. 252-356.000.
Takeuchi, Toshikatu; Goto, Kihei; Ichihashi, Yasuro; and Kawase, Takenori, to Brother Kogyo Kabushiki Kaisha. Sewing machine. 4,381,722, Cl. 112-235.000.
Takeuchi, Yukihisa: *See*—
Mizuno, Junzi; Takeuchi, Yukihisa; Fukami, Akira; Wakayama, Masao; and Tomita, Masahiro, 4,381,929, Cl. 55-316.000.
Tamai, Kouichi; and Tanaka, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for mounting electronic components. 4,381,601, Cl. 29-740.000.
Tanabe, Eiji: *See*—
Meddaugh, Gard; Tanabe, Eiji; and Vaguine, Victor, 4,382,208, Cl. 315-5.410.
Tanaka, Haruhiko: *See*—
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Tanaka, Honami: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tomonori, 4,381,990, Cl. 208-39.000.
Tanaka, Masao: *See*—
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Tanaka, Shigenori: *See*—
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Tapco Products Company, Inc.: *See*—
MacLeod, Richard J., 4,381,633, Cl. 52-473.000.
Tassara, Jean-Pierre, to Orogil. Preparation of magnesium alkylphenates and their use as detergent-dispersant additives for lubricating oils. 4,382,004, Cl. 252-25.000.
Tassi, Lamberto: *See*—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,381,637, Cl. 53-51.000.
Tate, Mark C.: *See*—
Croy, David G.; Hollingsworth, Lee M.; Williams, Leonard E., Jr.; Jolly, Richard D.; and Tate, Mark C., 4,381,868, Cl. 277-27.000.
Taylor, Byron K., to RCA Corporation. Video disc player having stylus position sensing apparatus. 4,382,292, Cl. 369-43.000.
Technicare Corporation: *See*—
Hottinger, Charles F., 4,381,787, Cl. 128-660.000.
Tektronix, Inc.: *See*—
Hofer, Bruce E., 4,382,233, Cl. 330-107.000.
Ishijima, Yasumori; and Murooka, Rikichi, 4,382,198, Cl. 307-555.000.
Terry, D. A., to Terry, D. A. Fluid temperature monitor. 4,381,744, Cl. 123-198.0DC.
Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,382,037, Cl. 260-465.00F.
Texaco Inc.: *See*—
Chafetz, Harry; Love, Richard F.; and Waldbillig, James O., 4,382,007, Cl. 252-51.50A.
Texas Instruments Incorporated: *See*—
Appelt, Daren K., 4,382,278, Cl. 364-200.000.
George, William L., 4,382,043, Cl. 261-39.00E.
Th. Goldschmidt AG: *See*—
Herget, Camillo; Domazer, Hans-Gunter; and Velicescu, Mircea, 4,382,061, Cl. 420-435.000.
Thaxton Inc.: *See*—
Leslie, Bruce E., 4,381,800, Cl. 138-90.000.
Thermal Dynamics Corporation: *See*—
Hedberg, John B. G., 4,382,171, Cl. 219-130.100.
Thery, Pierre; Ravalitera, Guy; and Cornet, Michel, to Agence Nationale De Valoriastion De La Recherche (ANVAR). Device sensitive to a temperature gradient and its application for constructing a thermal fluxmeter or solar sensor. 4,382,154, Cl. 136-206.000.
Thomas, Jeffrey G.: *See*—
Borin, Frank W.; and Thomas, Jeffrey G., 4,382,155, Cl. 174-38.000.
Thomas, William R., to Baxter Travenol Laboratories, Inc. Therapeutic method for treating blood-clotting defects with factor VIIa. 4,382,083, Cl. 424-101.000.
Thomson-CSF: *See*—
Becavin, Henri; and Grousseau, Alain, 4,382,259, Cl. 343-106.00D.
Fraleux, Jean; and Ploix, Jean L., 4,382,187, Cl. 250-578.000.
Gauthier, Gerard, 4,382,230, Cl. 324-207.000.
Laurent, Pierre, 4,382,232, Cl. 329-117.000.
Pearsall, Thomas, 4,382,265, Cl. 357-16.000.
Tabourier, Remy, 4,382,258, Cl. 343-17.20R.
Thormann, Harald; Gose, Horst; and Weser, Arnold, to Siemens Aktiengesellschaft. Method for interpolating between cartesian and rotary coordinates in machines. 4,381,608, Cl. 33-1.00M.
Thorud, Stanley R.: *See*—
Rivkin, Eric M.; and Thorud, Stanley R., 4,381,836, Cl. 206-387.000.
Thumberger, Olibelle. Adjustable foot brace. 4,381,572, Cl. 5-444.000.
Titone, Roger: *See*—
Klauba, Bruce; and Titone, Roger, 4,381,673, Cl. 73-579.000.
Toastmaster, Inc.: *See*—
Huggler, Peter E., 4,382,175, Cl. 219-413.000.
Tobin, Curtis L.; and Ciarlei, Joseph A., to Carrier Corporation. Combination reversing valve and expansion device for a reversible refrigeration circuit. 4,381,798, Cl. 137-625.430.
Tobino, Seiji: *See*—
Inoue, Akihiko; Inoue, Hirofumi; Nakamura, Tsuyoshi; Tobino, Seiji; and Baba, Masamitsu, 4,381,856, Cl. 266-281.000.
Todokoro, Hideo: *See*—
Matsuzaka, Takashi; and Todokoro, Hideo, 4,382,182, Cl. 250-307.000.
Tokai Denka Kogyo Kabushiki: *See*—
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Tokura, Norihito: *See*—
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Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Dezawa, Syuichi, 4,381,842, Cl. 220-72.000.
Kajimura, Motoji; Echigo, Hiroyuki; and Hashizume, Yoshiaki, 4,382,213, Cl. 315-382.000.
Menju, Shinichi; and Kamata, Isao, 4,382,276, Cl. 363-141.000.
Saitoh, Shinji, 4,382,289, Cl. 365-96.000.
Tamai, Kouichi; and Tanaka, Masao, 4,381,601, Cl. 29-740.000.
Tolentino, Luisito A., to General Electric Company. Silicone rubber compositions for liquid injection molding machines. 4,382,057, Cl. 264-328.200.
Tolley, William K.: *See*—
Laughlin, William C.; and Tolley, William K., 4,382,082, Cl. 423-150.000.
Tomita, Masahiro: *See*—
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Toth nee Balogh, Anna: *See*—
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Townsend, Wesley P.: *See*—
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Townsley, Charles W.: *See*—
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Toyo Kogyo Co., Ltd.: *See*—
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Toyota Jidosha Kabushiki Kaisha: *See*—
Miyagi, Hideo; and Nakano, Jiro, 4,381,746, Cl. 123-339.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Akira; Sato, Yoshimi; Ando, Masahisa; and Hiraiwa, Nobuo, 4,381,698, Cl. 91-382.000.
Hirayama, Tsutomu, 4,381,736, Cl. 123-41.100.
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Otsuki, Hiromi, 4,381,747, Cl. 123-339.000.
Sato, Yoshimi; Hiraiwa, Nobuo; and Hasegawa, Akira, 4,381,799, Cl. 137-625.680.
Tressler, Richard E.: *See*—
Smith, Russell D.; and Tressler, Richard E., 4,382,104, Cl. 427-226.000.
Tribby, Charles T.; Clawson, Arthur H., Jr.; and Clawson, Charles D., to Radio Materials Corporation. Housing and spring support for piezoelectric resonator. 4,382,203, Cl. 310-355.000.

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Cottrell, Peter E.; and Troutman, Ronald R., 4,382,229, Cl. 324-158.00T.

Troy, James E., to Fieldcrest Mills, Inc. Simulated grass pile fabric. 4,381,805, Cl. 139-391.000.

Trumpf GmbH & Co.: *See*—
Klingel, Hans, 4,382,170, Cl. 219-121.0PP.

Trutschel, Willi, to Maschinenfabrik Moenus AG. Machine for treating hides or the like. 4,381,655, Cl. 69-38.000.

Trzaskos, Casmir R., to General Electric Company. Ultrasonic transducer and process to obtain high acoustic attenuation in the backing. 4,382,201, Cl. 310-327.000.

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Rosenberg, Harold; and Tsai, Tsu-tzu, 4,382,144, Cl. 556-440.000.

Tsubouchi, Natsuro: *See*—
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Tsuchiya, Noriyuki: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Kitajima, Eiji; Tsuchiya, Noriyuki; and Sunada, Tomonori, 4,381,990, Cl. 208-39.000.

Turner, William H. Rotary valved internal combustion engine. 4,381,737, Cl. 123-41.400.

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Uerdingen, Walter: *See*—
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UMC Industries, Inc.: *See*—
Shah, Hasmukh R.; and Gupta, Ashok K., 4,381,835, Cl. 194-1.00N.

Umezawa, Hidetugu; Gotoh, Miyuki; Tanaka, Shigenori; and Nakao, Masashi, to Nissan Motor Co., Ltd. Shuttleless loom weft detaining device. 4,381,807, Cl. 139-452.000.

Umezawa, Seiji: *See*—
Takasugi, Tsuneji; and Umezawa, Seiji, 4,382,172, Cl. 219-137.00R.

Undin, Hans: *See*—
Wiener, Hans; and Undin, Hans, 4,381,661, Cl. 72-409.000.

Union Special Corporation: *See*—
Abrams, Jack S., 4,381,720, Cl. 112-121.150.

United Kingdom Atomic Energy Authority: *See*—
Rigby, Frank, 4,382,053, Cl. 264-120.000.

United McGill Corporation: *See*—
Noll, Charles G., 4,381,927, Cl. 55-138.000.

United Recording Electronic Industries: *See*—
Putnam, Milton T., 4,381,831, Cl. 181-152.000.

U.S. Environmental Products, Inc.: *See*—
Roberts, Robert L.; and Janssen, Felix G., 4,381,998, Cl. 210-503.000.

United States Gypsum Company: *See*—
Glejf, Robert G., 4,381,578, Cl. 16-94.00D.

United States of America
Air Force: *See*—
Houle, Omer, 4,381,884, Cl. 350-287.000.
Rosenberg, Harold; and Tsai, Tsu-tzu, 4,382,144, Cl. 556-440.000.
Army: *See*—
Freibergs, Elmer; Horn, Robert E.; and Jacobs, Harold, 4,382,261, Cl. 343-854.000.
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Harlow, John L., 4,382,048, Cl. 264-0.500.
Environmental Protection Agency: *See*—
Bell, John P., 4,381,681, Cl. 73-863.030.
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Chen, Bill C. J.; and Hartop, Robert W. Waveguide cooling system. 4,382,239, Cl. 333-248.000.
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Bell, Charles H., 4,381,881, Cl. 350-96.160.
Gahn, Randall F.; Reid, Margaret A.; and Yang, Chiang Y., 4,382,116, Cl. 429-34.000.
Miller, Emmett L., 4,382,224, Cl. 323-269.000.
Studer, Philip A., 4,381,875, Cl. 308-10.000.
von Tiesenhausen, Georg F., 4,381,583, Cl. 24-214.000.
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Desai, Jaydev D., 4,381,955, Cl. 148-20.300.

U.S. Philips Corporation: *See*—
Daenen, Theo E. G.; van Dijk, Gerardus A. R.; and Stolk, Steven A., 4,381,975, Cl. 204-14.00N.
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Punter, Hendrik; and Wagenaar, Kornelis J., 4,381,957, Cl. 148-188.000.
Sanders, Franciscus H. M.; Sanders, Jozef A. M.; and Dieleman, Jan, 4,381,967, Cl. 156-643.000.

United Technologies Corporation: *See*—
Boye, David W.; and Crockett, Neil M., 4,381,577, Cl. 15-304.000.
Clelford, Douglas H.; and Murphy, Richard D., 4,382,283, Cl. 364-434.000.
Fowler, Donald W.; Brand, Raymond J.; and Clelford, Douglas H., 4,382,281, Cl. 364-424.000.
Pinter, Warren H.; and Blaney, David H., 4,381,960, Cl. 156-175.000.

University of Rochester, The: *See*—
Goldstein, Irving S.; Kalk, Franklin D.; and Deckman, Harry W., 4,381,963, Cl. 156-245.000.

UOP Inc.: *See*—
Arena, Blaise J., 4,382,150, Cl. 568-863.000.
Castillo, Carmen; and Hayes, John C., 4,382,015, Cl. 252-417.000.
Kulprathipanja, Santi; and Neuzil, Richard W., 4,382,001, Cl. 210-674.000.
Laughlin, William C.; and Tolley, William K., 4,382,082, Cl. 423-150.000.
Polak, Anthony J., 4,382,101, Cl. 427-40.000.
Rohrbach, Ronald P.; and Maliarik, Mary J., 4,382,121, Cl. 435-94.000.
Wagner, Walter R., 4,381,820, Cl. 166-231.000.

Upjohn Company, The: *See*—
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Uskokovic, Milan R.: *See*—
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USM Corporation: *See*—
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Vaguine, Victor: *See*—
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van de Leemput, Lambertus J. M. A.; Nooijen, Godefridus A. H.; and van der Loo, Hendrikus W., to Stamicarbon, B.V. Process for the preparation of an olefin polymerization catalyst. 4,382,020, Cl. 252-432.000.

Vanderhoof, Danae A.: *See*—
Fujioka, George S.; and Vanderhoof, Danae A., 4,382,072, Cl. 423-468.000.

van der Loo, Hendrikus W.: *See*—
van de Leemput, Lambertus J. M. A.; Nooijen, Godefridus A. H.; and van der Loo, Hendrikus W., 4,382,020, Cl. 252-432.000.

Vanderpool, Clarence D.: *See*—
Gingerich, Richard G.; Vanderpool, Clarence D.; Scheithauer, Richard A.; and MacInnis, Martin B., 4,381,937, Cl. 75-0.5AA.

van der Velden, Hendricus H., to Stork Screens B.V. Printing cylinder with an outside covering and a method and apparatus for applying a covering on a cylinder surface. 4,381,961, Cl. 156-215.000.

Van de Spijker, Willebrordus H. M. M.: *See*—
Jan Verstegen, Judicus M. P.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,382,207, Cl. 313-486.000.

van Dijk, Gerardus A. R.: *See*—
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van Nuis, Pieter W.: *See*—
Conklin, Harold A., Jr.; and van Nuis, Pieter W., 4,381,691, Cl. 84-440.000.

Van Sickle, Jean. Permanent wave mandrel device for hair. 4,381,791, Cl. 132-40.000.

Varian Associates, Inc.: *See*—
Meddaugh, Gard; Tanabe, Eiji; and Vaguine, Victor, 4,382,208, Cl. 315-5.410.

Varta Batterie Aktiengesellschaft: *See*—
Kunze, Dieter, 4,382,117, Cl. 429-132.000.

Vedamuthu, Ebenezer R.; and Shah, Ramesh B., to Microlife Technics, Inc. Method for the preparation of naturally thickened and stabilized fermented milk products and products produced thereby. 4,382,097, Cl. 426-43.000.

Velicescu, Mircea: *See*—
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Verdicchio, Robert J.: *See*—
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Verlijsdonk, Johannus G.: *See*—
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Villemont, Claude M.; Bricaud, Herve G. P. M.; and Hamaide, Pierre, to Socapex. Electrical and thermal interconnection system for electronic circuit boards and an electrical cabinet fitted with such a system. 4,382,271, Cl. 361-386.000.
von Tiesenhausen, Georg F., to United States of America, National Aeronautics and Space Administration. Beam connector apparatus and assembly. 4,381,583, Cl. 24-214.000.
Vostovich, Joseph E.: *See*—
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Vyas, Ambrish H.: *See*—
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W. R. Grace & Co., Cryovac Division: *See*—
Watson, Keith M.; Jones, Floyd L.; and Adams, Dwight V., 4,382,058, Cl. 264-527.000.
Wada, Kazuhiro. Isotope separation with an infrared laser. 4,381,923, Cl. 23-293.00R.
Wagenaar, Kornelis J.: *See*—
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Wagner, Walter R., to UOP Inc. Filament reinforced plastic screen and apparatus for making same. 4,381,820, Cl. 166-231.000.
Wakamiya, Wataru: *See*—
Denda, Masahiko; Sato, Shinichi; Wakamiya, Wataru; Harada, Hiroshi; Tsubouchi, Natsuro; and Miyoshi, Hirokazu, 4,381,595, Cl. 29-589.000.
Wakayama, Masao: *See*—
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Waki, Tatsuo: *See*—
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Waldbillig, James O.: *See*—
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Waldmann, Helmut: *See*—
Jupe, Christoph; Waldmann, Helmut; Baumert, Jurgen; and Schummer, Gunther, 4,381,973, Cl. 203-80.000.
Walker, Thad O.; Brownawell, Darrell W.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Drilling fluids containing an additive composition. 4,382,002, Cl. 252-8.50C.
Wall, Berth-Ove G.: *See*—
Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Ove G., 4,382,246, Cl. 338-26.1HR.
Wallace, George A. Incident light filter for cameras. 4,381,890, Cl. 354-59.000.
Walling, Jorg-Hein; Arbuthnot, Gerald R.; and Dumoulin, Andre, to Northern Telecom Limited. Fluidizable bed structure. 4,381,728, Cl. 118-621.000.
Walsworth, Frank J., to Outboard Marine Corporation. Mechanical fuel pressure operated device for supplying a fuel/oil mixture. 4,381,741, Cl. 123-73.0AD.
Walter, John, to Continental Packaging Company, Inc. Method of securing an end closure to a container body. 4,381,959, Cl. 156-69.000.
Wang, Chia-Gee. Detection of atoms using monochromatic X-rays. 4,382,181, Cl. 250-305.000.
Wang Laboratories, Inc.: *See*—
Rasekhi, Houshang; and Nelson, Alfred M., 4,381,966, Cl. 156-630.000.
Wangner Systems, Inc.: *See*—
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Warshawsky, Jay, to Fuller Company. Method and apparatus for roasting fine grained ores. 4,381,916, Cl. 432-14.000.
Waschkuttis, Gerhard, to Mundorf, Walter, a part interest. Gasoline economizing attachment device for internal combustion engines. 4,381,756, Cl. 123-591.000.
Washington University: *See*—
Swanson, Wilbur M., 4,381,663, Cl. 73-37.000.
Watanabe, Juro; Ohnishi, Keizo; Ishiguro, Toru; and Ogawa, Takatoshi, to Japan Steel Works, Ltd., The. Low alloy heat-resisting steel for high temperature use. 4,381,940, Cl. 75-124.000.
Waters Instruments, Inc.: *See*—
Burton, Thomas A., 4,381,765, Cl. 128-1.00R.
Watkins and Watson Limited: *See*—
Clark, Raymond P.; and Hunt, William V., 4,381,664, Cl. 73-40.700.
Watson, Keith M.; Jones, Floyd L.; and Adams, Dwight V., to W. R. Grace & Co., Cryovac Division. Process for forming a single-walled blow molded hinged container. 4,382,058, Cl. 264-527.000.
Watterback, Paul G., to AB Sibe International. Moisture actuated trigger device. 4,381,710, Cl. 102-200.000.
Weatherford, Stonebor, Inc.: *See*—
Greene, George J., Jr., 4,381,821, Cl. 166-243.000.
Weidmann, Erich; and Ruegg, Alfred, to Gebruder Loepfe AG. Electronic weft thread monitor. 4,381,803, Cl. 139-370.200.
Weinstock, Joseph: *See*—
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Weintraub, Herbert S., to Quantic Industries, Inc. Method of making an incendiary munition. 4,381,692, Cl. 86-20.00B.
Welch, Mack D.; and Speer, William B., to General Motors Corporation. Method of manufacturing universal joint housing. 4,381,659, Cl. 72-340.000.
Wem, James W., to Imperial Chemical Industries PLC. Centrifugal gas-liquid contact apparatus. 4,382,045, Cl. 261-89.000.
Wendt, Jon R., to Greenview Manufacturing Company. Squeegee/-sponge device with dual durometer. 4,381,575, Cl. 15-121.000.
Wentworth Laboratories Inc.: *See*—
Evans, Arthur, 4,382,228, Cl. 324-158.00F.
Werkzeugbau Wolfgruben GmbH: *See*—
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Wernikoff, Robert E., to Cardiac Imaging Limited Partnership. Apparatus and method for simultaneously displaying relative displacements of a fluctuating biological object. 4,382,184, Cl. 378-37.000.
Wert, Kenneth P., Jr., to Wert, Kenneth P., Sr. Multiple speaker type sound producing system. 4,382,157, Cl. 179-1.00G.
Wert, Kenneth P., Sr.: *See*—
Wert, Kenneth P., Jr., 4,382,157, Cl. 179-1.00G.
Weser, Arnold: *See*—
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Westerkamp, Jurgen: *See*—
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Western Electric Co. Inc.: *See*—
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Davidson, Ronnie D.; and Preston, Bruce S., 4,382,270, Cl. 361-115.000.
Ferree, Herbert E.; and Boomgaard, Dirk J., 4,381,852, Cl. 242-7.130.
Heytmeijer, Herman R., 4,382,069, Cl. 423-56.000.
Kraft, Joseph K., 4,381,851, Cl. 238-232.000.
Pai, Stephen M., 4,382,248, Cl. 340-310.00A.
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Wetzel, William H.: *See*—
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White, Thomas E.; and Lind, Paul U., to GTE Automatic Electric Labs Inc. Microcomputer controlled key telephone line circuit. 4,382,163, Cl. 179-99.0LC.
Wico Corporation: *See*—
Kim, Syng N., 4,382,166, Cl. 200-6.00A.
Wideman, Lawson G.; and Kuczkowski, Joseph A., to Goodyear Tire & Rubber Company, The. Process for the conversion of terpenes to cymenes. 4,382,152, Cl. 585-430.000.
Wienen, Walter: *See*—
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Wiener, Hans; and Undin, Hans, to C. A. Weidmuller GmbH & Co. Tool having two working jaws. 4,381,661, Cl. 72-409.000.
Wilkins, Cletus W., Jr.: *See*—
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Williams, Kenneth E.: *See*—
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Willman, Benjamin C.: *See*—
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Wilson, Alan L.: *See*—
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Wilson, John B. Hydrogen supplemented diesel electric locomotive. 4,382,189, Cl. 290-3.000.
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Winkler, John W.: *See*—
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Wisebaker, Sandra M.; and White, Paul L., to Owens-Illinois, Inc. Chromatography device and method of making chromatography test. 4,382,000, Cl. 210-658.000.
Wishman, Marvin, to Phillips Petroleum Company. Method and apparatus for absorbing moisture. 4,381,611, Cl. 34-9.000.
Wissmann, Michael: *See*—
Maisch, Wolfgang; Peters, Jurgen; Wissmann, Michael; Gmelin, Karl; and Stiefel, Peter, 4,381,751, Cl. 123-454.000.
Wojcik, Warren. Solar panel. 4,381,764, Cl. 126-426.000.
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Wolff, Siegfried: *See*—
Kuhner, Gerhard; Wolff, Siegfried; and Rothbuhr, Lothar, 4,381,949, Cl. 106-307.000.
Wood, Paul A. P., to PIFCO Limited. Temperature control arrangement for an electrical heating appliance. 4,382,176, Cl. 219-494.000.
Wood, William E.; and MacQueen, Donald K., to Phillips Petroleum Company. Reclaiming used lubricating oil. 4,381,992, Cl. 208-179.000.
Woolgar, Anthony J., to English Electric Valve Company Limited. Image intensifier devices. 4,382,180, Cl. 250-213.0VT.
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Yamaguchi, Etsuji; and Hotta, Hideo, to Aron Kasei Co., Ltd. Sealing agent injecting machine. 4,381,727, Cl. 118-408.000.
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Yamamoto, Kimiaki; and Koike, Takaharu, to Olympus Optical Co., Ltd. Light absorptive film provided with a reflection preventive means. 4,381,883, Cl. 350-164.000.
Yamamoto, Shinichi; Asano, Mitsuru; Suzuki, Zituo; and Ito, Toshihiko, to Nippon Soken, Inc. Extrusion die for forming a honeycomb structure. 4,381,912, Cl. 425-461.000.
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Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Ohgoh, Toshiharu; Murakami, Manabu; Oketani, Kiyoshi; and Fujisaki, Hideaki, to Eisai Co., Ltd. 6,10,14,18-Tetramethyl-5,9,13,17-nonadecatetraene-2-ols. 4,382,151, Cl. 568-875.000.
Yancey, Bruce O.: *See*—
Baumgartner, Walter P.; and Yancey, Bruce O., 4,382,044, Cl. 261-76.000.
Yang, Chiang Y.: *See*—
Gahn, Randall F.; Reid, Margaret A.; and Yang, Chiang Y., 4,382,116, Cl. 429-34.000.
Yeboah, Yaw D., to General Electric Company. Method of hydrolyzing organochlorosilanes. 4,382,145, Cl. 556-460.000.
Yoda, Hiroshi, to Nihon Dempa Kogyo Co., Ltd. Tuning fork-shaped quartz oscillator. 4,382,204, Cl. 310-366.000.
Yokokura, Hisao; Kitamura, Teruo; Ito, Ren; Nakano, Fumio; Morishita, Hirosada; Sato, Mikio; and Kando, Yasuhiko, to Hitachi, Ltd. Liquid crystal display element. 4,381,886, Cl. 350-341.000.
Yokoyama, Youichi: *See*—
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,382,240, Cl. 335-8.000.
Yoshida Kogyo K.K.: *See*—
Yoshieda, Keiichi; and Iimura, Yoshitaka, 4,381,593, Cl. 29-408.000.
Yoshida, Ryo: *See*—
Kosuge, Yoshiaki; Yoshida, Ryo; Sumida, Seizo; Oshita, Hirofumi; Otsuki, Soji; and Kamoshita, Katsuzo, 4,381,935, Cl. 71-88.000.
Yoshida, Takeshi: *See*—
Ito, Naoya; Yoshida, Takeshi; Aoki, Masahiro; Okubo, Masao; and Miki, Masayoshi, 4,381,941, Cl. 75-130.500.
Yoshieda, Keiichi; and Iimura, Yoshitaka, to Yoshida Kogyo K.K. Method and apparatus for applying top end stops to a fastener stringer chain. 4,381,593, Cl. 29-408.000.
Yperman, Jacques L.: *See*—
De Backer, Jean A.; and Yperman, Jacques L., 4,382,274, Cl. 362-153.000.
Yuzawa, Teruo; and Uchida, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Evaporative emission control device of an internal combustion engine for vehicle use. 4,381,753, Cl. 123-520.000.
Zafiropoulo, Arthur W.: *See*—
Maher, Joseph A., Jr.; and Zafiropoulo, Arthur W., 4,381,965, Cl. 156-345.000.
Zagt, Rudolf: *See*—
Berkhoff, Hendrik J.; and Zagt, Rudolf, 4,382,078, Cl. 424-45.000.
Zallen, Dennis M.: *See*—
Carver, George P.; Heap, Michael P.; Martin, G. Blair; Pershing, David W.; Rees, Dee P.; and Zallen, Dennis M., 4,381,718, Cl. 110-347.000.
Zenith Radio Corporation: *See*—
Marchese, Joseph N., 4,381,843, Cl. 220-335.000.
Zeugner, Horst; Roemer, Dietmar; and Liepmann, Hans, to Kali-Chemie Pharma GmbH. 2-Acylaminomethyl-1,4-benzodiazepine derivatives and their salts, pharmaceutical compositions thereof and process for their preparation. 4,382,030, Cl. 260-239.0BD.
Zlobin, Valery F.: *See*—
Rabkin, Daniil M.; Ryabov, Vladimir R.; Bernadsky, Vsevolod N.; Stretovich, Anatoly D.; Kirpaty, Vladimir A.; Koval, Ivan A.; Zlobin, Valery F.; Menaker, Arkady B.; Sherman, Yakov I.; Meleshko, Nikolai N.; and Shalai, Alexandr N., 4,382,169, Cl. 219-76.100.
Zwiener, Rudolf; Beer, Werner; and Santo, Giuseppe D., to Aktiengesellschaft Adolph Saurer. Cloth templing device for looms. 4,381,802, Cl. 139-294.000.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 3RD DAY OF MAY, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bose, Amar G., to Bose Corporation. Loudspeaker system. Re. 31,228, Cl. 179-1.00E.

Bose Corporation: *See*—
Bose, Amar G., Re. 31,228, Cl. 179-1.00E.

Brayley, Elwin J.: *See*—
Swift, Thomas E.; Brayley, Elwin J.; and Noddin, Ray C., Re. 31,230, Cl. 322-91.000.

Burroughs Corporation: *See*—
Ogle, James A.; and Holz, George E., Re. 31,231, Cl. 340-769.000.

Eli Lilly and Company: *See*—
Soper, Quentin F., Re. 31,226, Cl. 564-441.000.
Soper, Quentin F., Re. 31,227, Cl. 564-441.000.

Eltra Corporation: *See*—
Swift, Thomas E.; Brayley, Elwin J.; and Noddin, Ray C., Re. 31,230, Cl. 322-91.000.

Holz, George E.: *See*—
Ogle, James A.; and Holz, George E., Re. 31,231, Cl. 340-769.000.

King, Kenyon M. Stepping motor control. Re. 31,229, Cl. 318-696.000.

Leach Industries, Inc.: *See*—
Rodgers, Robert E., Jr., Re. 31,224, Cl. 273-73.00C.

Noddin, Ray C.: *See*—
Swift, Thomas E.; Brayley, Elwin J.; and Noddin, Ray C., Re. 31,230, Cl. 322-91.000.

Ogle, James A.; and Holz, George E., to Burroughs Corporation. Panel-type display device. Re. 31,231, Cl. 340-769.000.

Rodgers, Robert E., Jr., to Leach Industries, Inc. Metal-plastic composite racquet. Re. 31,224, Cl. 273-73.00C.

Soper, Quentin F., to Eli Lilly and Company. 4-Trifluoromethyl-2,6-dinitroanilines. Re. 31,226, Cl. 564-441.000.

Soper, Quentin F., to Eli Lilly and Company. 4-Trifluoromethyl-2,6-dinitroanilines. Re. 31,227, Cl. 564-441.000.

Suppa, Paul: *See*—
Willis, Alan E.; and Suppa, Paul, Re. 31,225, Cl. 368-70.000.

Swift, Thomas E.; Brayley, Elwin J.; and Noddin, Ray C., to Eltra Corporation. Breakerless flywheel magneto ignition system. Re. 31,230, Cl. 322-91.000.

Timex Corporation: *See*—
Willis, Alan E.; and Suppa, Paul, Re. 31,225, Cl. 368-70.000.

Willis, Alan E.; and Suppa, Paul, to Timex Corporation. Single switch arrangement for adjusting the time being displayed by a timepiece. Re. 31,225, Cl. 368-70.000.

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# LIST OF REEXAMINATION PATENTEES

TO WHOM

## CERTIFICATES WERE ISSUED

Bullivant, Kenneth W., to K-Tron International, Inc. Digital mass flow control system. B1 Re. 30,684, Cl. 222—55.

K-Tron International, Inc.: *See* —
Bullivant, Kenneth W. B1 30,684, Cl. 222—55.

DeMarco, Richard, to Clairol Incorporated. Stable oil-in-water emulsion hair dye composition. B1 3,811,830 Cl. 8—405.

Clairol Incorporated: *See*—
DeMarco, Richard. B1 3,811,830 Cl. 8—405.

Ferguson, William C., to Cooper Industries, Inc. Cutting tool. B1 4,092,776, Cl. 30—253.

Cooper Industries, Inc.: *See*—
Ferguson, William C. B1 4,092,776, Cl. 30—253.

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# LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 268,833, Cl. D13-23.000.

Adams, John F., to H. E. Rudge & Co. Ltd.; and Assoc. Builders Merchants, Limited. Drinking fountain bubbler. 268,841, 5-3-83, Cl. D7-398.000.

Albright, Donald L.; Hampton, Wade E.; and Schroeder, Guy D., to Rainbow Mining and Manufacturing, Incorporated. Floating gold dredge. 268,832, 5-3-83, Cl. D12-300.000.

Almere Projects B.V.: *See*—
Venker, Jacob W. M., 268,816, Cl. D10-37.000.

Alva Medical, Inc.: *See*—
Benham, Thomas H.; Martinsen, James A.; and Scharnberg, Lorne C., 268,871, Cl. D24-53.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Playground slide. 268,859, 5-3-83, Cl. D21-244.000.

Ament, Duane S.: *See*—
Ament, Donald S.; and Ament, Duane S., 268,859, Cl. D21-244.000.

American Cyanamid Company: *See*—
Black, Seymour, 268,811, Cl. D9-303.000.

Assoc. Builders Merchants, Limited: *See*—
Adams, John F., 268,841, Cl. D7-398.000.

Avon Products, Inc.: *See*—
Ohama, Yoshitomo, 268,795, Cl. D4-25.000.

Bacon, James D. Bed sheet tucking device. 268,804, 5-3-83, Cl. D6-292.000.

Benedict, Maxwell E. Novelty paddle. 268,854, 5-3-83, Cl. D21-213.000.

Benham, Thomas H.; Martinsen, James A.; and Scharnberg, Lorne C., to Alva Medical, Inc. Medical tubing hub for catheters or the like. 268,871, 5-3-83, Cl. D24-53.000.

Berg, Soren B. D.: *See*—
Sundstrom, Uno T.; and Berg, Soren B. D., 268,872, Cl. D25-17.000.
Sundstrom, Uno T.; and Berg, Soren B. D., 268,873, Cl. D25-17.000.
Sundstrom, Uno T.; and Berg, Soren B. D., 268,874, Cl. D25-17.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 268,800, Cl. D6-177.000.

Black, Seymour, to American Cyanamid Company. Surgical suture package. 268,811, 5-3-83, Cl. D9-303.000.

Brine, William H., Jr., to W. H. Brine Company. Game ball. 268,853, 5-3-83, Cl. D21-205.000.

Cain, David E., to Halliburton Company. Pressurized density measuring apparatus. 268,820, 5-3-83, Cl. D10-83.000.

Carbajales Santa-Eulalia, Javier B.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 268,822, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 268,826, Cl. D11-162.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a Dalmatian. 268,822, 5-3-83, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a dove. 268,826, 5-3-83, Cl. D11-162.000.

Check, Dwight E.: *See*—
Rice, Verle L.; and Check, Dwight E., 268,843, Cl. D15-127.000.

Clark, Robert J.: *See*—
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., 268,817, Cl. D10-64.000.
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., 268,818, Cl. D10-64.000.

Crowe, Scott D., to Crowe, Scott D. Table A-frame for a booth seating system. 268,801, 5-3-83, Cl. D6-191.000.

Dassesse, Jean; and Wybauw, Jacques. Mini-vehicle. 268,829, 5-3-83, Cl. D12-91.000.

Desai, Mayadevi: *See*—
Desai, Satish V.; and Desai, Mayadevi, 268,866, Cl. D23-3.000.

Desai, Satish V.; and Desai, Mayadevi. Reverse osmosis water purifier. 268,866, 5-3-83, Cl. D23-3.000.

Dohogne, Charles L. Orthopedic fixation canula. 268,870, 5-3-83, Cl. D24-33.000.

D'Orleans, Henri, to L'Oreal. Bottle. 268,812, 5-3-83, Cl. D9-335.000.

Eastern Electrical Equipment: *See*—
Shuman, Bernard E., 268,849, Cl. D20-43.000.

Ellis, Merle R. Router pattern. 268,819, 5-3-83, Cl. D10-64.000.

Feldberg, Saul, to Global Upholstery Company Limited. Armchair. 268,799, 5-3-83, Cl. D6-72.000.

Fender, C. Leo. Vibrato bridge for stringed musical instruments. 268,845, 5-3-83, Cl. D17-21.000.

Fenwick, Loel. Combined leg and foot support. 268,802, 5-3-83, Cl. D6-200.000.

Firepower, Inc.: *See*—
Gwinn, Mack W., Jr., 268,861, Cl. D22-7.000.

Fisher, Lin, to Foxbat Precision Golf Equipment. Golf club head. 268,856, 5-3-83, Cl. D21-220.000.

Foxbat Precision Golf Equipment: *See*—
Fisher, Lin, 268,856, Cl. D21-220.000.

Fulster, Chris. Combined duck decoy and stabilizers. 268,862, 5-3-83, Cl. D22-21.000.

Fulster, Chris. Duck decoy with stabilizing elements. 268,863, 5-3-83, Cl. D22-21.000.

Gil Designs, Ltd.: *See*—
Mack, Franklin G., 268,851, Cl. D21-41.000.

Global Upholstery Company Limited: *See*—
Feldberg, Saul, 268,799, Cl. D6-72.000.

Gordon, Charles O., Jr., to Montigny, Joseph W. Ore concentrating tray. 268,842, 5-3-83, Cl. D15-147.000.

Gwinn, Mack W., Jr., to Firepower, Inc. Firearm muzzle brake or similar article. 268,861, 5-3-83, Cl. D22-7.000.

H. E. Rudge & Co. Ltd.: *See*—
Adams, John F., 268,841, Cl. D7-398.000.

Halliburton Company: *See*—
Cain, David E., 268,820, Cl. D10-83.000.

Hampton, Wade E.: *See*—
Albright, Donald L.; Hampton, Wade E.; and Schroeder, Guy D., 268,832, Cl. D12-300.000.

Hartung, Philip F. Squeeze bottle. 268,810, 5-3-83, Cl. D9-301.000.

Harvey, Fred C.: *See*—
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., 268,817, Cl. D10-64.000.
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., 268,818, Cl. D10-64.000.

Hollister, Carol S., legal representative: *See*—
Hollister, John C., Sr., deceased; and Hollister, Carol S., legal representative, 268,847, Cl. D19-20.000.

Hollister, John C., Sr., deceased; and by Hollister, Carol S., legal representative. Calendar holder or similar article. 268,847, 5-3-83, Cl. D19-20.000.

Horsley, Ronald L. Combined container and cap with attached spoon. 268,813, 5-3-83, Cl. D9-337.000.

John J. Madison Company, Inc.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 268,822, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 268,826, Cl. D11-162.000.

Jolliffe, John E., to SCM Corporation. Control knob for an office machine. 268,846, 5-3-83, Cl. D18-12.000.

Keene Corporation: *See*—
Leithauser, Donald J., Jr., 268,876, Cl. D26-72.000.

Kodaka, Tatsuya. Ant figure. 268,823, 5-3-83, Cl. D11-158.000.

Kodaka, Tatsuya. Cricket figure. 268,824, 5-3-83, Cl. D11-158.000.

Kodaka, Tatsuya. Mantis figure. 268,827, 5-3-83, Cl. D11-162.000.

Kohler, Henry G. Shutter slat. 268,875, 5-3-83, Cl. D25-47.000.

Kola, Tapani. Toilet foot-stool for children. 268,796, 5-3-83, Cl. D6-5.000.

Kowalewicz, Frank A., to Rockwell International Corporation. Wrench. 268,805, 5-3-83, Cl. D8-27.000.

Kyotaru Co., Ltd.: *See*—
Uno, Koki, 268,794, Cl. D1-2.000.

Larson, Donald L. Figurine. 268,825, 5-3-83, Cl. D11-158.000.

Laurel-Plastic Kurt Lorber: *See*—
Lorber, Kurt, 268,848, Cl. D19-99.000.

Leithauser, Donald J., Jr., to Keene Corporation. High intensity light fixture. 268,876, 5-3-83, Cl. D26-72.000.

Little, Darlan R. Brooch or the like. 268,821, 5-3-83, Cl. D11-74.000.

Loewenstine, Michael M., to Spray Shield, Inc. Hair spray shield. 268,877, 5-3-83, Cl. D28-9.000.

Long, Stapleton, to Berkline Corporation, The. Table. 268,800, 5-3-83, Cl. D6-177.000.

Lorber, Kurt, to Laurel-Plastic Kurt Lorber. Tab for index cards. 268,848, 5-3-83, Cl. D19-99.000.

L'Oreal: *See*—
D'Orleans, Henri, 268,812, Cl. D9-335.000.

Love, Philip G. Bottle cap remover. 268,806, 5-3-83, Cl. D8-37.000.

Mack, Franklin G., to Gil Designs, Ltd. Playing die. 268,851, 5-3-83, Cl. D21-41.000.

Marontate, John D. Track for an accordion type folding door. 268,809, 5-3-83, Cl. D8-377.000.

Martinsen, James A.: *See*—
Benham, Thomas H.; Martinsen, James A.; and Scharnberg, Lorne C., 268,871, Cl. D24-53.000.

Mascheroni, John. Chair. 268,797, 5-3-83, Cl. D6-47.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Sheet-metal heat sink for electronic semiconductor devices. 268,833, 5-3-83, Cl. D13-23.000.

McPherson, Mathew, Sr. String instrument pick. 268,844, 5-3-83, Cl. D17-20.000.

Miller Brewing Company: *See*—
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., 268,817, Cl. D10-64.000.
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., 268,818, Cl. D10-64.000.

Miracle Recreation Equipment Company: *See*—
Ament, Donald S.; and Ament, Duane S., 268,859, Cl. D21-244.000.

Montigny, Joseph W.: *See*—
Gordon, Charles O., Jr., 268,842, Cl. D15-147.000.

Nehrbas, George M., Jr. Golf putter head. 268,855, 5-3-83, Cl. D21-217.000.

Ohama, Yoshitomo, to Avon Products, Inc. Toothbrush. 268,795, 5-3-83, Cl. D4-25.000.

Ohashi, Shigeo. Switch. 268,836, 5-3-83, Cl. D13-37.000.

Ohashi, Shigeo. Switch. 268,837, 5-3-83, Cl. D13-37.000.

Ohashi, Shigeo. Switch. 268,838, 5-3-83, Cl. D13-37.000.

Oy Partek AB: *See*—
Sutela, Leo, 268,830, Cl. D12-93.000.

Pennington, Brent A. Heat sensitive switch. 268,835, 5-3-83, Cl. D13-32.000.

Phoenix Hovercraft Corp.: *See*—
Turner, Daniel G. W., 268,828, Cl. D12-5.000.

Potter, Sterling L. Wear and adjustment indicator for vehicle brakes system. 268,831, 5-3-83, Cl. D12-180.000.

Rainbow Mining and Manufacturing, Incorporated: *See*—
Albright, Donald L.; Hampton, Wade E.; and Schroeder, Guy D., 268,832, Cl. D12-300.000.

Rasmussen, Allen B. Bingo card rack. 268,852, 5-3-83, Cl. D21-57.000.

Reed, Claude A., to Whirla Whip Marketing Corporation. Frozen comestibles dispenser housing. 268,840, 5-3-83, Cl. D7-300.000.

Revlon, Inc.: *See*—
Scalice, John J., 268,814, Cl. D9-384.000.

Reynolds, Michael J., to Reynolds, Michael J. Splitting device with varying cross sections. 268,807, 5-3-83, Cl. D8-47.000.

Rice, Verle L.; and Check, Dwight E. Combination planar molder. 268,843, 5-3-83, Cl. D15-127.000.

Rivette, Dennie M., Jr. Fish lure. 268,864, 5-3-83, Cl. D22-27.000.

Roberts, Frank L. Back rest. 268,803, 5-3-83, Cl. D6-200.000.

Rockwell International Corporation: *See*—
Kowalewicz, Frank A., 268,805, Cl. D8-27.000.

Rowland, David L. Counter armchair. 268,798, 5-3-83, Cl. D6-72.000.

Rubbermaid Incorporated: *See*—
Taylor, William D., 268,878, Cl. D32-55.000.

Sanderson, Roger S.; and Whelchel, Robert C., to Sanderson, Roger S. Autoclave container. 268,867, 5-3-83, Cl. D24-9.000.

Scalice, John J., to Revlon, Inc. Bottle. 268,814, 5-3-83, Cl. D9-384.000.

Scharnberg, Lorne C.: *See*—
Benham, Thomas H.; Martinsen, James A.; and Scharnberg, Lorne C., 268,871, Cl. D24-53.000.

Schroeder, Guy D.: *See*—
Albright, Donald L.; Hampton, Wade E.; and Schroeder, Guy D., 268,832, Cl. D12-300.000.

Schwalbach, Richard I. Carrying handle for a carton or the like. 268,815, 5-3-83, Cl. D9-434.000.

SCM Corporation: *See*—
Jolliffe, John E., 268,846, Cl. D18-12.000.

Shuman, Bernard E., to Eastern Electrical Equipment. Display card holder. 268,849, 5-3-83, Cl. D20-43.000.

Smith, Lloyd V., to Western Control Equipment Co. Switch guard for heater control unit. 268,834, 5-3-83, Cl. D13-32.000.

Spray Shield, Inc.: *See*—
Loewenstine, Michael M., 268,877, Cl. D28-9.000.

Sundstrom, Uno T.; and Berg, Soren B. D. House. 268,872, 5-3-83, Cl. D25-17.000.

Sundstrom, Uno T.; and Berg, Soren B. D. House. 268,873, 5-3-83, Cl. D25-17.000.

Sundstrom, Uno T.; and Berg, Soren B. D. House. 268,874, 5-3-83, Cl. D25-17.000.

Sutela, Leo, to Oy Partek AB. Exchange platform frame for mounting on the frame of a truck or the like. 268,830, 5-3-83, Cl. D12-93.000.

Taylor, William D., to Rubbermaid Incorporated. Over-sink dish drainer. 268,878, 5-3-83, Cl. D32-55.000.
Toff, Maurice. Dental anterior pontic. 268,868, 5-3-83, Cl. D24-66.000.
Toff, Maurice. Dental posterior pontic. 268,869, 5-3-83, Cl. D24-10.000.
Tollens, Paul M. Two wheel roller skate. 268,857, 5-3-83, Cl. D21-226.000.
Turner, Daniel G. W., to Phoenix Hovercraft Corp. Air cushion vehicle. 268,828, 5-3-83, Cl. D12-5.000.
Uno, Koki, to Kyotaru Co., Ltd. Sushi. 268,794, 5-3-83, Cl. D1-2.000.
Venker, Jacob W. M., to Almere Projects B.V. Pocket watch. 268,816, 5-3-83, Cl. D10-37.000.
Vukadinovic, Dragan. Combined chess game board and game piece holder or the like. 268,850, 5-3-83, Cl. D21-23.000.
W. H. Brine Company: *See*—
Brine, William H., Jr., 268,853, Cl. D21-205.000.
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., to Miller Brewing Company. Fill height gauge. 268,817, 5-3-83, Cl. D10-64.000.
Watts, Norman L.; Clark, Robert J.; and Harvey, Fred C., to Miller Brewing Company. Fill height gauge. 268,818, 5-3-83, Cl. D10-64.000.
Wendorff, Erwin R. Telephone enclosure. 268,839, 5-3-83, Cl. D14-53.000.
Wesener, William, Jr. Bolt guard. 268,808, 5-3-83, Cl. D8-346.000.
Western Control Equipment Co.: *See*—
Smith, Lloyd V., 268,834, Cl. D13-32.000.
Whelchel, Robert C.: *See*—
Sanderson, Roger S.; and Whelchel, Robert C., 268,867, Cl. D24-9.000.
Whirla Whip Marketing Corporation: *See*—
Reed, Claude A., 268,840, Cl. D7-300.000.
Works, Michael L. Outdoor recreational device. 268,858, 5-3-83, Cl. D21-244.000.
Wybauw, Jacques: *See*—
Dassesse, Jean; and Wybauw, Jacques, 268,829, Cl. D12-91.000.
Yevak, Jack F. Swing seat. 268,860, 5-3-83, Cl. D21-246.000.
Zimmerman, Zane L. Fish holding tool. 268,865, 5-3-83, Cl. D22-31.000.

# LIST OF PLANT PATENTEES

Conard-Pyle Company, The: *See*—
Meilland, Marie L., 5,046, Cl. 11.000.
Garabedian, John M. Grapevine. 5,047, 5-3-83, Cl. 47.000.
Meilland, Marie L., to Conard-Pyle Company, The. Rose plant—Meirandival variety. 5,046, 5-3-83, Cl. 11.000.
Nor'East Miniature Roses, Inc.: *See*—
Saville, F. Harmon, 5,044, Cl. 7.000.
Saville, F. Harmon, 5,045, Cl. 9.000.
Pan American Plant Company: *See*—
Shoesmith, Leonard H., 5,048, Cl. 74.000.
Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant. 5,044, 5-3-83, Cl. 7.000.
Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant. 5,045, 5-3-83, Cl. 9.000.
Shoesmith, Leonard H., to Pan American Plant Company. Chrysanthemum named Pink Chiffon (SP6-267-P). 5,048, 5-3-83, Cl. 74.000.

# LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 3RD DAY OF MAY, 1983

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Marks, James R. Slab-type ice maker control. T103,001, 5-3-83, Cl. 62-139.000.
Petke, Frederick D. Polyester primer for adhesively bonded substrates. T103,002, 5-3-83, Cl. 524-605.000.

# CLASSIFICATION OF PATENTS

## ISSUED MAY 3, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 3**

| | |
|---|---|
| 1.7 | 4,381,567 |

**CLASS 4**

| | |
|---|---|
| 239 | 4,381,568 |
| 295 | 4,381,569 |

**CLASS 5**

| | |
|---|---|
| 13 | 4,381,570 |
| 66 | 4,381,571 |
| 444 | 4,381,572 |

**CLASS 8**

| | |
|---|---|
| 405 | B1 3,811,830 |
| 405 | 4,381,919 |
| 406 | 4,381,920 |

**CLASS 12**

| | |
|---|---|
| 12 | 4,381,573 |

**CLASS 15**

| | |
|---|---|
| 97 R | 4,381,574 |
| 121 | 4,381,575 |
| 236 R | 4,381,576 |
| 304 | 4,381,577 |

**CLASS 16**

| | |
|---|---|
| 94 D | 4,381,578 |
| 111 R | 4,381,579 |
| 243 | 4,381,580 |
| 259 | 4,381,581 |

**CLASS 17**

| | |
|---|---|
| 44.3 | 4,381,582 |

**CLASS 23**

| | |
|---|---|
| 293 R | 4,381,923 |

**CLASS 24**

| | |
|---|---|
| 214 | 4,381,583 |
| 263 D | 4,381,584 |
| 270 | 4,381,585 |

**CLASS 26**

| | |
|---|---|
| 2 E | 4,381,586 |
| 78 | 4,381,587 |

**CLASS 29**

| | |
|---|---|
| 116 AD | 4,381,588 |
| 149.5 R | 4,381,589 |
| 157 R | 4,381,590 |
| 157.1 R | 4,381,591 |
| 157.3 AH | 4,381,592 |
| 408 | 4,381,593 |
| 508 | 4,381,594 |
| 585 | 4,381,598 |
| 589 | 4,381,595 |
| 623.1 | 4,381,596 |
| 623.2 | 4,381,597 |
| 717 | 4,381,599 |
| 738 | 4,381,600 |
| 740 | 4,381,601 |
| 840 | 4,381,602 |

**CLASS 30**

| | |
|---|---|
| 253 | B1 4,092,776 |
| 43.92 | 4,381,603 |
| 169 | 4,381,604 |
| 240 | 4,381,605 |
| 387 | 4,381,606 |

**CLASS 33**

| | |
|---|---|
| 1 G | 4,381,607 |
| 1 M | 4,381,608 |
| 125 C | 4,381,609 |
| 312 | 4,381,610 |

**CLASS 34**

| | |
|---|---|
| 9 | 4,381,611 |
| 116 | 4,381,612 |

**CLASS 36**

| | |
|---|---|
| 121 | 4,381,613 |

**CLASS 40**

| | |
|---|---|
| 118 | 4,381,614 |
| 334 | 4,381,615 |
| 502 | 4,381,616 |

**CLASS 43**

| | |
|---|---|
| 9 | 4,381,617 |

**CLASS 46**

| | |
|---|---|
| 22 | 4,381,618 |
| 25 | 4,381,619 |
| 47 | 4,381,620 |

**CLASS 47**

| | |
|---|---|
| 33 | 4,381,622 |
| 40.5 | 4,381,621 |
| 48.5 | 4,381,623 |
| 58 | 4,381,624 |

**CLASS 48**

| | |
|---|---|
| 197 R | 4,381,924 |

**CLASS 49**

| | |
|---|---|
| 280 | 4,381,625 |
| 385 | 4,381,626 |
| 453 | 4,381,627 |

**CLASS 51**

| | |
|---|---|
| 170 TL | 4,381,628 |
| 298 | 4,381,925 |

**CLASS 52**

| | |
|---|---|
| 66 | 4,381,629 |
| 169.5 | 4,381,630 |
| 173 DS | 4,381,631 |
| 262 | 4,381,632 |
| 473 | 4,381,633 |
| 506 | 4,381,634 |
| 639 | 4,381,635 |
| 648 | 4,381,636 |

**CLASS 53**

| | |
|---|---|
| 51 | 4,381,637 |

**CLASS 55**

| | |
|---|---|
| 48 | 4,381,926 |
| 138 | 4,381,927 |
| 170 | 4,381,928 |
| 316 | 4,381,929 |
| 339 | 4,381,930 |

**CLASS 57**

| | |
|---|---|
| 90 | 4,381,638 |
| 229 | 4,381,639 |
| 242 | 4,381,640 |

**CLASS 60**

| | |
|---|---|
| 39.06 | 4,381,641 |
| 204 | 4,381,642 |
| 303 | 4,381,643 |
| 313 | 4,381,644 |
| 398 | 4,381,645 |
| 452 | 4,381,646 |
| | 4,381,647 |
| 517 | 4,381,648 |

**CLASS 62**

| | |
|---|---|
| 47 | 4,381,649 |
| 157 | 4,381,650 |
| 296 | 4,381,651 |
| 514 JT | 4,381,652 |

**CLASS 63**

| | |
|---|---|
| 2 | 4,381,653 |

**CLASS 65**

| | |
|---|---|
| 18.1 | 4,381,931 |
| 66 | 4,381,932 |
| 106 | 4,381,933 |
| 135 | 4,381,934 |

**CLASS 69**

| | |
|---|---|
| 19.2 | 4,381,654 |
| 38 | 4,381,655 |

**CLASS 70**

| | |
|---|---|
| 451 | 4,381,656 |

**CLASS 71**

| | |
|---|---|
| 88 | 4,381,935 |
| 100 | 4,381,936 |

**CLASS 72**

| | |
|---|---|
| 60 | 4,381,657 |
| 234 | 4,381,658 |
| 340 | 4,381,659 |
| 342 | 4,381,660 |
| 409 | 4,381,661 |

**CLASS 73**

| | |
|---|---|
| 35 | 4,381,662 |
| 37 | 4,381,663 |
| 40.7 | 4,381,664 |
| 73 | 4,381,665 |
| 87 | 4,381,666 |
| 154 | 4,381,667 |
| 202 | 4,381,668 |
| 432 PS | 4,381,669 |
| 471 | 4,381,670 |
| 487 | 4,381,671 |
| 505 | 4,381,672 |
| 579 | 4,381,673 |
| 599 | 4,381,674 |
| 620 | 4,381,675 |
| 657 | 4,381,676 |
| 718 | 4,381,677 |
| 728 | 4,381,678 |
| 861.05 | 4,381,679 |
| 861.38 | 4,381,680 |
| 863.03 | 4,381,681 |

**CLASS 74**

| | |
|---|---|
| 476 | 4,381,682 |
| 594.6 | 4,381,683 |
| 862 | 4,381,684 |

**CLASS 75**

| | |
|---|---|
| 0.5 AA | 4,381,937 |
| 2.51 | 4,381,943 |
| 42 | 4,381,938 |
| 82 | 4,381,939 |
| 124 | 4,381,940 |
| 130.5 | 4,381,941 |
| 255 | 4,381,944 |

**CLASS 81**

| | |
|---|---|
| 57.2 | 4,381,685 |

**CLASS 83**

| | |
|---|---|
| 104 | 4,381,686 |
| 404.3 | 4,381,687 |
| 887 | 4,381,688 |

**CLASS 84**

| | |
|---|---|
| 1.01 | 4,381,689 |
| 422 R | 4,381,690 |
| 440 | 4,381,691 |

**CLASS 86**

| | |
|---|---|
| 20 B | 4,381,692 |

**CLASS 89**

| | |
|---|---|
| 36 K | 4,381,693 |
| 190 | 4,381,694 |

**CLASS 91**

| | |
|---|---|
| 178 | 4,381,695 |
| 382 | 4,381,698 |
| 433 | 4,381,699 |
| 497 | 4,381,700 |
| 499 | 4,381,701 |
| 506 | 4,381,702 |

**CLASS 99**

| | |
|---|---|
| 304 | 4,381,696 |
| 353 | 4,381,697 |
| 516 | 4,381,703 |

**CLASS 100**

| | |
|---|---|
| 35 | 4,381,704 |

**CLASS 101**

| | |
|---|---|
| 69 | 4,381,705 |
| 127.1 | 4,381,706 |
| 282 | 4,381,707 |
| 365 | 4,381,708 |
| 375 | 4,381,709 |

**CLASS 102**

| | |
|---|---|
| 200 | 4,381,710 |
| 275.11 | 4,381,711 |
| 503 | 4,381,712 |

**CLASS 105**

| | |
|---|---|
| 215 C | 4,381,713 |

**CLASS 106**

| | |
|---|---|
| 1.14 | 4,381,945 |
| 22 | 4,381,946 |
| 38.5 D | 4,381,947 |
| 288 B | 4,381,948 |
| 307 | 4,381,949 |

**CLASS 108**

| | |
|---|---|
| 147 | 4,381,714 |
| 152 | 4,381,715 |

**CLASS 109**

| | |
|---|---|
| 2 | 4,381,716 |

**CLASS 110**

| | |
|---|---|
| 184 | 4,381,717 |
| 347 | 4,381,718 |

**CLASS 112**

| | |
|---|---|
| 121.11 | 4,381,719 |
| 121.15 | 4,381,720 |
| 158 E | 4,381,721 |
| 235 | 4,381,722 |

**CLASS 114**

| | |
|---|---|
| 45 | 4,381,723 |
| 65 R | 4,381,724 |
| 126 | 4,381,725 |

**CLASS 118**

| | |
|---|---|
| 315 | 4,381,726 |
| 408 | 4,381,727 |
| 621 | 4,381,728 |
| 622 | 4,381,729 |
| 674 | 4,381,730 |

**CLASS 119**

| | |
|---|---|
| 21 | 4,381,731 |
| 45 R | 4,381,732 |
| 52 B | 4,381,733 |
| | 4,381,734 |

**CLASS 122**

| | |
|---|---|
| 510 | 4,381,735 |

**CLASS 123**

| | |
|---|---|
| 41.1 | 4,381,736 |
| 41.4 | 4,381,737 |
| 52 M | 4,381,738 |
| 54 B | 4,381,739 |
| 58 AA | 4,381,740 |
| 73 AD | 4,381,741 |
| 142.5 R | 4,381,742 |
| 188 M | 4,381,743 |
| 198 DC | 4,381,744 |
| 294 | 4,381,745 |
| 339 | 4,381,746 |
| | 4,381,747 |
| 414 | 4,381,748 |
| 432 | 4,381,749 |
| 446 | 4,381,750 |
| 454 | 4,381,751 |
| 475 | 4,381,752 |
| 520 | 4,381,753 |
| 538 | 4,381,754 |
| 573 | 4,381,755 |
| 591 | 4,381,756 |
| 606 | 4,381,757 |

**CLASS 126**

| | |
|---|---|
| 41 R | 4,381,758 |
| 121 | 4,381,759 |
| 123 | 4,381,760 |
| 243 | 4,381,761 |
| 247 | 4,381,762 |
| 416 | 4,381,763 |
| 426 | 4,381,764 |

**CLASS 128**

| | |
|---|---|
| 1 R | 4,381,765 |
| 62 R | 4,381,766 |
| 79 | 4,381,767 |
| 80 C | 4,381,768 |
| 91 R | 4,381,769 |
| 92 BA | 4,381,770 |
| 129 | 4,381,771 |
| 132 R | 4,381,772 |
| 200.14 | 4,381,773 |
| 202.22 | 4,381,774 |
| 359 | 4,381,785 |
| 419 PG | 4,381,786 |
| 660 | 4,381,787 |
| 722 | 4,381,788 |
| 798 | 4,381,789 |

**CLASS 132**

| | |
|---|---|
| 37 R | 4,381,790 |
| 40 | 4,381,791 |
| 75.6 | 4,381,792 |

**CLASS 134**

| | |
|---|---|
| 3 | 4,381,950 |
| 26 | 4,381,951 |
| 60 | 4,381,793 |
| 67 | 4,381,794 |

**CLASS 136**

| | |
|---|---|
| 206 | 4,382,154 |

**CLASS 137**

| | |
|---|---|
| 240 | 4,381,795 |
| 596.2 | 4,381,796 |
| 599 | 4,381,797 |
| 625.43 | 4,381,798 |
| 625.68 | 4,381,799 |

**CLASS 138**

| | |
|---|---|
| 90 | 4,381,800 |
| 148 | 4,381,801 |

**CLASS 139**

| | |
|---|---|
| 294 | 4,381,802 |
| 370.2 | 4,381,803 |
| 384 B | 4,381,804 |
| 391 | 4,381,805 |
| 450 | 4,381,806 |
| 452 | 4,381,807 |

**CLASS 141**

| | |
|---|---|
| 39 | 4,381,808 |

**CLASS 143**

| | |
|---|---|
| 2 R | 4,381,809 |

**CLASS 148**

| | |
|---|---|
| 1.5 | 4,381,952 |
| | 4,381,953 |
| 2 | 4,381,954 |
| 20.3 | 4,381,955 |
| 175 | 4,381,956 |
| 188 | 4,381,957 |

**CLASS 149**

| | |
|---|---|
| 19.8 | 4,381,958 |

**CLASS 152**

| | |
|---|---|
| 209 R | 4,381,810 |

**CLASS 156**

| | |
|---|---|
| 69 | 4,381,959 |
| 175 | 4,381,960 |
| 215 | 4,381,961 |
| 244.11 | 4,381,962 |
| 245 | 4,381,963 |
| 344 | 4,381,964 |
| 345 | 4,381,965 |
| 630 | 4,381,966 |
| 643 | 4,381,967 |
| 663 | 4,381,968 |

**CLASS 160**

| | |
|---|---|
| 168 R | 4,381,811 |
| 172 | 4,381,812 |

**CLASS 162**

| | |
|---|---|
| 5 | 4,381,969 |
| 152 | 4,381,970 |

**CLASS 164**

| | |
|---|---|
| 527 | 4,381,813 |

**CLASS 165**

| | |
|---|---|
| 1 | 4,381,814 |
| 10 | 4,381,815 |
| 40 | 4,381,816 |
| 110 | 4,381,817 |
| 133 | 4,381,818 |
| 156 | 4,381,819 |

**CLASS 166**

| | |
|---|---|
| 231 | 4,381,820 |
| 243 | 4,381,821 |
| 326 | 4,381,822 |

**CLASS 172**

| | |
|---|---|
| 155 | 4,381,823 |

**CLASS 174**

| | |
|---|---|
| 38 | 4,382,155 |
| 72 B | 4,382,156 |

**CLASS 175**

| | |
|---|---|
| 229 | 4,381,824 |
| 393 | 4,381,825 |

**CLASS 177**

| | |
|---|---|
| 211 | 4,381,826 |

**CLASS 179**

| | |
|---|---|
| 1 D | 4,382,158 |
| 1 E | Re.31,228 |
| 1 G | 4,382,157 |
| 1 HF | 4,382,159 |
| 15.55 R | 4,382,160 |
| 81 C | 4,382,161 |
| 90 A | 4,382,162 |
| 99 LC | 4,382,163 |
| 170.2 | 4,382,164 |

**CLASS 180**

| | |
|---|---|
| 139 | 4,381,827 |
| 247 | 4,381,828 |
| 274 | 4,381,829 |

**CLASS 181**

| | |
|---|---|
| 129 | 4,381,830 |
| 152 | 4,381,831 |
| 266 | 4,381,832 |

**CLASS 192**

| | |
|---|---|
| 85 V | 4,381,833 |

**CLASS 193**

| | |
|---|---|
| 35 J | 4,381,834 |

**CLASS 194**

| | |
|---|---|
| 1 N | 4,381,835 |

**CLASS 200**

| | |
|---|---|
| 5 A | 4,382,165 |
| 6 A | 4,382,166 |
| 153 J | 4,382,167 |

**CLASS 202**

| | |
|---|---|
| 158 | 4,381,974 |
| 205 | 4,381,971 |
| 248 | 4,381,972 |

**CLASS 203**

| | |
|---|---|
| 80 | 4,381,973 |

**CLASS 204**

| | |
|---|---|
| 14 N | 4,381,975 |
| 64 T | 4,381,976 |
| 74 | 4,381,977 |
| 75 | 4,381,978 |
| 98 | 4,381,979 |
| 158 R | 4,381,980 |
| 197 | 4,381,981 |
| 212 | 4,381,982 |
| 252 | 4,381,983 |
| 258 | 4,381,984 |
| 296 | 4,381,985 |

**CLASS 206**

| | |
|---|---|
| 387 | 4,381,836 |
| 485 | 4,381,837 |

**CLASS 208**

| | |
|---|---|
| 8 R | 4,381,986 |
| 10 | 4,381,987 |
| 11 R | 4,381,988 |
| | 4,381,989 |
| 39 | 4,381,990 |
| 113 | 4,381,991 |
| 179 | 4,381,992 |
| 217 | 4,381,993 |

**CLASS 210**

| | |
|---|---|
| 120 | 4,381,994 |
| 137 | 4,381,995 |
| 195.1 | 4,381,996 |
| 352 | 4,381,997 |
| 503 | 4,381,998 |
| 637 | 4,381,999 |
| 658 | 4,382,000 |
| 674 | 4,382,001 |

**CLASS 211**

| | |
|---|---|
| 71 | 4,381,838 |

**CLASS 212**

| | |
|---|---|
| 208 | 4,381,839 |

**CLASS 215**

| | |
|---|---|
| 329 | 4,381,840 |

**CLASS 219**

| | |
|---|---|
| 69 M | 4,382,168 |
| 76.1 | 4,382,169 |
| 121 PP | 4,382,170 |
| 130.1 | 4,382,171 |
| 137 R | 4,382,172 |
| 295 | 4,382,173 |
| 370 | 4,382,174 |
| 413 | 4,382,175 |
| 494 | 4,382,176 |
| 522 | 4,382,177 |

**CLASS 220**

| | |
|---|---|
| 23.4 | 4,381,841 |
| 72 | 4,381,842 |

335 4,381,843
378 4,381,844

**CLASS 221**

185 4,381,845

**CLASS 222**

55 B1 Re. 30,684
105 4,381,846

**CLASS 229**

2.5 R 4,381,847
43 4,381,848

**CLASS 236**

11 4,381,850

**CLASS 238**

232 4,381,851

**CLASS 242**

7.13 4,381,852

**CLASS 249**

205 4,381,853

**CLASS 250**

213 VT 4,382,180
305 4,382,181
307 4,382,182
310 4,382,183
385 4,382,185
492.2 4,382,186
578 4,382,187

**CLASS 252**

8.5 C 4,382,002
8.55 R 4,382,003
25 4,382,004
32.7 E 4,382,005
49.6 4,382,006
51.5 A 4,382,007
75 4,382,008
79 4,382,009
184 4,382,010
4,382,011
299.1 4,382,012
354 4,382,013
356 4,382,014
417 4,382,015
428 4,382,016
429 B 4,382,018
4,382,019
429 R 4,382,017
432 4,382,020
441 4,382,021
452 4,382,022
455 Z 4,382,023
511 4,382,024
607 4,382,025
628 4,382,026

**CLASS 260**

112 B 4,382,028
112 R 4,382,027
239 BB 4,382,029
239 BD 4,382,030
239.3 P 4,382,032
239.3 R 4,382,031
245.74 4,382,033
367 4,382,034
403 4,382,035
4,382,036
465 F 4,382,037
465.8 R 4,382,038
505 R 4,382,039
513 R 4,382,040
544 D 4,382,041
980 4,382,042

**CLASS 261**

39 E 4,382,043
41 D 4,382,047
76 4,382,044
89 4,382,045
94 4,382,046

**CLASS 264**

0.5 4,382,048
40.1 4,382,049
40.4 4,382,050
57 4,382,051
85 4,382,052
120 4,382,053
123 4,382,054
133 4,382,055
137 4,382,056
328.2 4,382,057
527 4,382,058

**CLASS 266**

54 4,381,854
248 4,381,855
281 4,381,856

**CLASS 267**

64.15 4,381,857

**CLASS 269**

29 4,381,858

**CLASS 270**

31 4,381,859

**CLASS 271**

10 4,381,860

**CLASS 272**

65 4,381,861

**CLASS 273**

11 C 4,381,862
63 A 4,381,863
73 C Re.31,224
88 4,381,864
294 4,381,865
422 4,381,866

**CLASS 277**

3 4,381,867
27 4,381,868
236 4,381,869

**CLASS 280**

33.99 B 4,381,870

**CLASS 285**

261 4,381,871

**CLASS 290**

1 C 4,382,188
3 4,382,189
55 4,382,190
4,382,191

**CLASS 294**

70 4,381,872

**CLASS 299**

5 4,381,873

**CLASS 301**

125 4,381,874

**CLASS 367**

141.4 4,382,192
221 D 4,382,193
264 4,382,194
280 4,382,195
400 4,382,196
470 4,382,197
555 4,382,198

**CLASS 308**

10 4,381,875

**CLASS 310**

87 4,382,199
157 4,382,200
327 4,382,201
328 4,382,202
355 4,382,203
366 4,382,204

**CLASS 312**

114 4,381,876
138 R 4,381,877

**CLASS 313**

25 4,382,205
346 R 4,382,206
486 4,382,207

**CLASS 315**

5.41 4,382,208
65 4,382,209
073 4,382,210
151 4,382,211
225 4,382,212
382 4,382,213

**CLASS 318**

254 4,382,214
568 4,382,215
630 4,382,216
696 Re.31,229
778 4,382,217
812 4,382,218

**CLASS 320**

2 4,382,219
4,382,220
35 4,382,221
61 4,382,222

**CLASS 322**

91 Re.31,230

**CLASS 323**

242 4,382,223
269 4,382,224

**CLASS 324**

73 R 4,382,225
94 4,382,226
115 4,382,227
158 F 4,382,228
158 T 4,382,229
207 4,382,230
439 4,382,231

**CLASS 329**

117 4,382,232

**CLASS 330**

107 4,382,233

**CLASS 331**

10 4,382,234
127 4,382,235

**CLASS 333**

1 4,382,236
24.1 4,382,237
134 4,382,238
248 4,382,239

**CLASS 335**

8 4,382,240
153 4,382,241
202 4,382,242
219 4,382,243
284 4,382,244
306 4,382,245

**CLASS 338**

26.13 HR 4,382,246
42 4,382,247

**CLASS 339**

14 R 4,381,878
44 R 4,381,879
97 P 4,381,880

**CLASS 340**

310 A 4,382,248
347 DD 4,382,249
347 P 4,382,250
384 E 4,382,251
562 4,382,252
680 4,382,253
744 4,382,254
769 Re.31,231
825.31 4,382,255
825.44 4,382,256
825.87 4,382,257

**CLASS 343**

17.2 R 4,382,258
106 D 4,382,259
730 4,382,260
854 4,382,261

**CLASS 346**

1.1 4,382,262
4,382,263
74.4 4,382,264

**CLASS 350**

96.16 4,381,881
96.20 4,381,882
164 4,381,883
287 4,381,884
318 4,381,885
341 4,381,886
358 4,381,887
458 4,381,888

**CLASS 354**

41 4,381,889
59 4,381,890
276 4,381,891
287 4,381,892

**CLASS 355**

3 SH 4,381,893

**CLASS 356**

72 4,381,894
134 4,381,895

**CLASS 357**

16 4,382,265

**CLASS 358**

86 4,382,266
213 4,382,267

**CLASS 360**

73 4,382,268
121 4,382,269

**CLASS 361**

115 4,382,270
386 4,382,271

**CLASS 362**

84 4,382,272
90 4,382,273
153 4,382,274

**CLASS 363**

41 4,382,275
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200 4,382,277
4,382,278
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412 4,382,280
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492 4,382,284
724 4,382,285
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8 4,382,288
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210 4,382,059
272 4,382,060

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331 4,382,095

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458 4,381,911
461 4,381,912

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460 4,382,145

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441 Re.31,226
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863 4,382,150
875 4,382,151

**CLASS 585**

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526 4,382,153

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6 4,381,775
188 4,381,777
191 4,381,778
202 4,381,779
317 4,381,776
368 4,381,782
4,381,783
372 4,381,781
892 4,381,780

**CLASS 605**

368 4,381,784

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1— | 2 | 268,794 | | 47 | 268,807 | D11— | 74 | 268,821 | | | 268,835 | | 41 | 268,851 | | 31 | 268,865 |
| D4— | 25 | 268,795 | | 346 | 268,808 | | 158 | 268,822 | | 37 | 268,836 | | 57 | 268,852 | D23— | 3 | 268,866 |
| D6— | 5 | 268,796 | | 377 | 268,809 | | | 268,823 | | | 268,837 | | 205 | 268,853 | D24— | 9 | 268,867 |
| | 47 | 268,797 | D9— | 301 | 268,810 | | | 268,824 | | | 268,838 | | 213 | 268,854 | | 10 | 268,869 |
| | 72 | 268,798 | | 303 | 268,811 | | | 268,825 | D14— | 53 | 268,839 | | 217 | 268,855 | | 33 | 268,870 |
| | | 268,799 | | 335 | 268,812 | | 162 | 268,826 | D15— | 127 | 268,843 | | 220 | 268,856 | | 53 | 268,871 |
| | 177 | 268,800 | | 337 | 268,813 | | | 268,827 | | 147 | 268,842 | | 226 | 268,857 | | 66 | 268,868 |
| | 191 | 268,801 | | 384 | 268,814 | D12— | 5 | 268,828 | D17— | 20 | 268,844 | | 244 | 268,858 | D25— | 17 | 268,872 |
| | 200 | 268,802 | | 434 | 268,815 | | 91 | 268,829 | | 21 | 268,845 | | | 268,859 | | | 268,873 |
| | | 268,803 | | | | | 93 | 268,830 | D18— | 12 | 268,846 | | 246 | 268,860 | | | 268,874 |
| | 292 | 268,804 | D10— | 37 | 268,816 | | 180 | 268,831 | D19— | 20 | 268,847 | D22— | 7 | 268,861 | | 47 | 268,875 |
| D7— | 300 | 268,840 | | 64 | 268,817 | | 300 | 268,832 | | 99 | 268,848 | | 21 | 268,862 | D26— | 72 | 268,876 |
| | 398 | 268,841 | | | 268,818 | D13— | 23 | 268,833 | D20— | 43 | 268,849 | | | 268,863 | D28— | 9 | 268,877 |
| D8— | 27 | 268,805 | | | 268,819 | | 32 | 268,834 | D21— | 23 | 268,850 | | 27 | 268,864 | D32— | 55 | 268,878 |
| | 37 | 268,806 | | 83 | 268,820 | | | | | | | | | | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 7 | 5,044 | | 9 | 5,045 | | 11 | 5,046 | | 47 | 5,047 | | 74 | 5,048 | | | |

## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

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(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


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| 01 : | 4,381,583 | 4,382,159 | 4,381,884 | 4,382,285 | 4,381,643 | 4,381,826 |
| 04 : | 4,381,602 | 4,382,161 | 4,381,958 | 4,382,294 | 4,381,659 | 4,381,841 |
| | 4,381,737 | 4,382,177 | 4,381,984 | 18 : Re.31,226 | 4,381,672 | 4,381,851 |
| | 4,382,099 | 4,382,188 | 4,381,985 | Re.31,227 | 4,381,706 | 4,381,909 |
| | 4,382,156 | 4,382,189 | 4,382,095 | 4,381,621 | 4,381,743 | 4,381,920 |
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| | 4,382,227 | 4,382,196 | 4,382,163 | 4,381,858 | 4,381,794 | 4,381,951 |
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| | 4,381,571 | 4,382,288 | 15 : 4,381,754 | 4,382,242 | 4,381,899 | 4,382,010 |
| | 4,381,576 | 4,382,296 | 17 : 4,381,575 | 4,382,292 | 4,382,013 | 4,382,011 |
| | 4,381,591 | 08 : 4,381,675 | 4,381,578 | 4,382,300 | 4,382,026 | 4,382,018 |
| | 4,381,652 | 4,381,677 | 4,381,615 | 19 : 4,381,631 | 4,382,089 | 4,382,029 |
| | 4,381,654 | 4,381,787 | 4,381,635 | 4,381,702 | 4,382,125 | 4,382,031 |
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| | 4,381,705 | 4,381,873 | 4,381,673 | 4,381,995 | 4,381,732 | 4,382,079 |
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| | 4,381,764 | 4,382,268 | 4,381,720 | 4,381,690 | 4,381,786 | 4,382,133 |
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| | 4,381,770 | 4,381,577 | 4,381,744 | 22 : 4,381,584 | 4,381,836 | 4,382,141 |
| | 4,381,830 | 4,381,790 | 4,381,783 | 24 : 4,381,759 | 4,381,865 | 4,382,164 |
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## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]


39 : T103,001 47 : T103,002


U.S. GOVERNMENT PRINTING OFFICE : O—1983

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